THE

LONDON JOURNAL

OF

Arts and Sciences;

CONTAINING

FULL DESCRIPTIONS OF THE PRINCIPLES AND DETAILS OF

EVERY NEW PATENT,

ALSO

Original Communications

ON OBJECTS CONNECTED WITH

SCIENCE AND PHILOSOPHY,

PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

IN

Practical Mechanics.

BY W. NEWTON,

CIVIL ENGINEER AND MECHANICAL DRAFTSMAN:

AND BY C. F. PARTINGTON

OF THE LONDON INSTITUTION.

VOL. III.

[SECOND SERIES.]

London:

PUBLISHED BY SHERWOOD AND CO. PATERNOSTER ROW;

AND W. NEWTON, OFFICE FOR PATENTS, 66, CHANCERY LANE.

1829.

W. Guthrie, Printer, 16, Shoe Lane, Fleet Street.

THE

London

JOURNAL OF ARTS AND SCIENCES,

No. XIII.

[SECOND SERIES.]

Original Communications.

ART. I.—ON THE FEES AND CHARGES UPON CHANCERY PATENTS FOR INVENTIONS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—When I was last in Paris, about three years ago, a society of sçavants was forming for the purpose of searching the Catacombs, in order to select skuls, that by means of some chemical process for which a *brèvet d'invention* was to be obtained, were to be filled with brains and other necessary organs, to replace the empty noddles of the then administration. The project, by some means, got wind—the government immediately ordered the Catacombs to be closed with stout masonry. For fear the Catacombs of Chancery may be closed before we pay our intended visit, seeing that some motion for a revision of the Patent Laws is before Parliament, I hasten to fulfil

my engagement, and introduce you in company with our ambulatory solicitor.

We enter with my Lord Privy Seal's warrant to the Lord Chancellor, to prepare and pass the required Patent. Here the grand process of mystification is in full action. "His Majesty being willing (as Mr. Attorney-General's verbose bill and the Patent express it) to give *encouragement* to all arts and inventions that might be for the public good, doth of his special grace, certain knowledge, and mere motion grant"—What? that those of his loving subjects, who have less wit than money, may have the *protection* of the great seal to their inventions, accompanied with trouble, perplexity, and expense, almost indescribable.

For preparing the Patent at the Patent Office, which is in the Adelphi, (and not Lincoln's Inn, as a certain agent pretends) a charge of 5*l.* 17*s.* 8*d.* is made; and a scandalous stamp duty affixed of 30*l.* 2*s.* for the *encouragement of arts*, no doubt. This stamp duty, and several others, its cousins german, I shall in due time observe upon. Then comes Mr. Deputy—to whom he is deputy, I believe only my Lord Chancellor can inform us. Mr. Deputy is to be paid, as *his* fee for doing one of the "*state-nothings*," 2*l.* 2*s.* Then the engrossing clerk, who does *something*, receives a gratuity of 10*s.* 6*d.*

We now approach the huge gaping Chancery HANAPER. Pause, Gentlemen, that no mischance happen, I will just describe the origin and uses of this ugly thing.

Harold the Saxon, had contracted in marriage, the fair daughter of William the Norman. Harold, like some modern princes and fashionables, entertained a dislike to his bedfellow, and repudiated her. The Norman Duke took this in great dudgeon; he came over with a powerful force to revenge the affront. The result was, as all the world knows, that the poor lady was left a widow.

William had now a long account to settle bewteen his assistants, the nobility and the supporters of the Saxon prince. The estates of the latter were found very ready and suitable rewards to the Norman soldiery. The Londoners, with intuitive and early civic penetration in matters of *plus et minus*, crept out of the mischief, by inviting the Conqueror to town, and proclaiming him king; upon which he courteously confirmed their ancient rights, by a short charter, declaring, to their immense satisfaction, that every man's child was the son of his father.

For the rest, who were not equally alert, he established a court, named *Aula Regis*, with a clerk or officer, termed *Referandarius*; the progenitor of our Chancellors. The chamber in which this officer sat, was provided with a great ugly coarse-wrought *wicker basket*. Now, Gentlemen, this great wicker basket was not to put the Saxon children into, who were *not* the sons of their fathers; but to put the accounts of their estates in, with petitions for their appropriation to the Norman Barons, and their followers. The "thing" *worked well*; indeed so well, as *fees* to the *hanaper* always accompanied the petition, *and ensured a favorable report*, that after its original use ceased, it was found a most *convenient* receptacle for the *money* and petitions of all, who had business to transact with the king. In process of time, the concerns of the *hanaper* so increased, that twelve *Referandarii*, and sometimes more, were found necessary to clear it of its golden eggs and paper stuff. (*Vid. Origines Juridiciales, Dugdale.*) Since that period, bags have been found for the cash, and desks provided for the papers. But the *hanaper* still retains its nominal ascendancy, and claims at present for the "*mere*" royal *motions* for the encouragement of all *arts and inventions*, the sum of 7 *l.* 13 *s.* 6 *d.* for the Lord Chancellor, for doing *nothing*; and to Mr. *Deputy Hanaper*,

for doing *something*, viz. for safely pursing his lordship's share of the spoil, 10*s*. 6*d*.

Having cleared this formidable machine, Mr. Recipi appears. Possibly you may truly observe, they have been one and all Mr. Recipi's, from the beginning to the end of the chapter. So they have been; but this gentleman is Mr. Recipi *per se et pro se*, who *advances* with his latinity pretensions, and demands for *his* services, 1*l*. 12*s*. 6*d*. What they are, or ever were, I believe it would puzzle the priestess of the Delphic oracle, if the old lady be still at her trade—to declare.

Mr. Recipi's demand is followed by one for a gratuity of 10*s*. 6*d*. for what, and for whom, you must fee the old lady to know.

Now, Gentlemen, make way for the advance of a personage *not* of a nondescript character and office, as is Mr. Recipi, but a real efficient and active officer, called the *Purse-bearer*, carrying a bag with a wooden box, not filled with mischief and evils, as was Pandora's; but containing his most gracious Majesty's royal arms engraved upon the great seal.

The person who applies this instrument, by which virtue and energy are given to the *motions* for the encouragement of *art*, is properly and technically named, *Mr. Yellow-wax*. This necessary personage commences his operations with sedately opening another box that contains bees'-wax, rosin, and turpentine, the composition from which he derives his cognomen. This he manipulates with indefatigable pains, until a quantity be fitted to receive upon its plastic form the impression which professes to guarantee the *security* of the invention. He then applies a portion to the document, and with a dexterous turn of a screw, impresses the authority which governs Britons.

Mr. Yellow-wax charges 10*s.* 6*d.* for his indispensable services; but that we may not come off too cheaply, the gentleman purse-bearer, who, during the operation, stands at his elbow with perfect inanity—at its conclusion, finds his intelligences returned from their excursion, and demands 1*l.* 1*s.* for their journey.

We now receive our Patent engrossed upon a skin of vellum, richly illuminated with a printed border, consisting of foliage interspersed between armorial and allegorical devices, in which the very appropriate figure of *Justice* is to be admired; and in the corner of the skin, within the flourish of the first letter, is a striking portrait of his late Majesty, the whole being executed in a style of graphic art, nearly approaching in excellence to the head piece of a halfpenny ballad.

To this superb document is appended, by silken cords, the mis-shapen lump of rosin and wax above-mentioned, called the great seal; the impression upon which has melted away, long before it reaches our hands. This is protected by a tin box, which, with the skin of vellum, is carefully enclosed in another of wood, covered with red leather and gilt. For these boxes, 9*s.* 6*d.* are charged, and on the payment of a further gratuity of 1*l.* 1*s.* to the clerk of the Patent Office for his civility, the street door is opened, and we are allowed to depart in full possession of our treasure.

Thus ends the farce of affixing the great seal *for the encouragement and protection of art and invention*, at a total expence, for our visit to the Patent hanaper department, of £.21. 19*s.* 2*d.*

But there is a little after-piece to be performed, which is the finale of the *regular* mystifications. Having witnessed the performances of the conjuring boxes and baskets of this Chancery juggle, we may not depart without paying

for the sleights of its petty-bag; not a *green* bag, but *Patent* true blue.

The origin of this bag is later than that of the great ugly Chancery hamper, and its uses were somewhat different. For some centuries, up to the time of Harry the Sixth, it served as the *old clothes bag* of the Judges of the Courts of Westminster. These luminaries of the law were, by ancient custom, served twice in the year, viz. at Christmas and at Whitsuntide, with a vesture, mantle, and linen; and at these periods they returned their worn habiliments to the *petty-bag*, as perquisites to its clerk. It happened, during the long contests between Lancaster and York—red and white—baron and knight—all for the *people's* rights, that the great hamper was repeatedly stormed and sacked, not of its papers, as cartridges were not then in use, but its collected coin was borne off by the alternate triumphant party. The judges found that their salaries were paid, and their clothes delivered, so irregularly, that they could not appear decently in public. They, in consequence, with the learned Serjeants at Law, petitioned Parliament, in the 18th year of Henry the Sixth, (A. D. 1440) complaining that for two years they had not received their salaries, nor fees, nor *clothing*; and they pray for the payment of their salaries, due and future, out of the first monies paid into the great Chancery hanaper; and also for an allowance in *money*, in lieu of their clothing and linen. (*Rott. Parl. N.* 27.)

The King in Parliament, by and with its advice, did assent to all things required, and writs were issued accordingly. (*Or. Jud. cap.* 40.)

Now comes the rub. How was the clerk of the old clothes bag to be remunerated for his loss of perquisites? Why, truly, Chancery *art* and *invention* were never yet at a loss, since the moment that Old Nick first suggested

their machinations, and became their original *patent* basket-maker. He proposed, that a *fee* in clean coin should supply the loss of the old clothes. The idea was excellent, and raised as great a tumult of approbation as when he made his opening speech from the throne to his legion of devils in Pandemonium. So the Inrolment Office was contrived, in which the pett-ybag is preserved, and remains, as the Jews say of the dry bones of their forefathers, "to this day;" but its officer, who takes charge of your specification, to deposit it with its brethren of "useful and valuable discoveries," makes a demand, according to its length, usually averaging about 5 *l.* and gives you a certificate, that "*all is right.*" The specification itself is encumbered with a stamp duty of 5 *l.* by way of *further encouragement* of all arts and inventions.

I may digress, *en passant,* to observe, that Old Nick, the Chancery basket-maker, soon contrived to save his choice protegés of the hanaper from the run upon it, to which the payment of the salaries, and allowances for clothes, to their sable brethren of the common law, had subjected it, by the statute 18 Hen. VI. He *suggested,* (Chancery mysteries are full of *suggestions*) that his own PECULIARS ought not to have their great store-basket so plundered, for a set of men who dealt in *facts* and open fair play, and managed to turn the common-lawyer over to the *King's* collectors of the revenue, viz. to the Exchequer, "as it is at this day." How he disposes of the fees of his dear *petty-bag*, he best knows. I believe his second great officer of state in *this* country, the Master of the Rolls, comes in for a full share.

The regular drama now closes; the *fixed* fees of this state-juggle have passed in revision. We will now turn our attention to the *occasional* demands which are made, as accessories to this system of absurdity, and cruel op-

pression of the talent and ingenuity of the community. If expedition be required, and the sealing of the patent be desired upon a day—not a regular *seal day*, in technical language, the operation is performed by *Mr. Yellow-wax*, of pressing His Majesty's heraldic honours into the plastic composition, for the additional charge of two guineas—and half-a-guinea for *expedition*, in bagging them safely. This is called a *private* seal, to distinguish it from the *public* operations of the great seal,—one of our legal distinctions without a difference; for they are all performed by the self-same machine, and equally before the *public*.

The next *occasional* charge we shall notice is one of the most unwarrantable, I will say *illegal* and *oppressive* demands, ever made under pretence of *prerogative*. It is the demand, in several of these State and Chancery offices, of *double* fees, if names of two partners, joint inventors, are inserted in the patent; of *treble* fees for three joint inventors, and so on. This scandalous extortion enhances the price of a patent at least twenty pounds, for the mere insertion of one name beyond the first; and of forty pounds for the addition of two, and of sixty for three, and so progressively!!

The exorbitant pretension of this claim upon joint Patentees, for absolutely doing *nothing*, without even a *Chancery suggestion* from the constructor of the hanaper, of *any service whatsoever* performed, leads me to consider, in this place, the legal claims, or rather the absence of *legal* claims to the present fees and gratuities, as fixed and demanded generally in the State and Patent Offices. My argument will be syllogistic, and will run thus:

Fees of office, not of ancient usage, and not authorized by a specific Act of Parliament, are altogether illegal; the fees at present demanded and paid, *are* fees neither of

ancient usage, nor authorized by any Act of Parliament; consequently, the increase of such fees beyond the amount of the ancient fees, by whatever authority established, *is altogether illegal.*

I take it for granted that the statutes of the realm, and the expositions of our best commentators thereon, are the only rules which should direct the argument.

The statute *De Tallagio non concedendo,* (34 *Ed. I. c.* 1) declares that "no tallage or aid shall be set or levied by us or our heirs, in this our kingdom, without the will and assent of the archbishops, bishops, earls, barons, knights, burgesses, and others, the free commons of this our realm." Our great commentator, in his *2d Inst.* observes, "These words are plain, without any scruple, and *absolute*, without any saving;" and he continues:—"Within this act are all new offices erected, with new fees, or *old offices with new fees,* for that is a tallage upon the subject, which cannot be done without common assent, by *Act of Parliament.*" And upon 9 Hen. III, c. 9, being a re-enactment, by Parliament, of Magna Charta, the same invaluable expositor says, "It is a maxime in law, that a man cannot claim any thing by custome or prescription against a statute."

Roger Acherley, a learned expositor of the 17th century, upon the same ancient statutes, asserts, that upon the construction of the statute De Tallagio, "No manner of fees, aids, taxes or tallages, should be taken for *any manner of business or occasions whatsoever,* but by common consent of the realm in Parliament," &c. (*p.* 5.) And "*this statute was a confirmation of Magna Charta,* which remained without interruption, during 331 years, as the *settled law of the land,* 'till Charles the First infracted it." (*Acherly, p.* 169.)

And the statute of *Magna Charta,* 9 *Hen. III.* was con-

firmed by no less than thirty-one several statutes, up to the *4th Hen. V.* (*A. D.* 1417). The *28th Edw. I. st.* 3, declares Magna Charta to be common law, and several statutes ordain, "that if any thing be done contrary thereto, *let it be holden for nought.*" Our great Coke, in his Institutes, our learned Selden, in his *MSS. Discourses on Government*, and also W. Lambart, a celebrated Master in Chancery, in his *Archaion*, repeatedly assert the inefficacy of the great seal itself to disturb or delay common law, or common right. So says the statute, 2 *Edw. III.* "No commandmant, under the King's seal, shall disturb or delay common right."

The 1*st William and Mary*, *cap.* 4, called the Declaration of Rights, enacts, "That the levying of money, *by pretence of prerogative*, without grant of Parliament, for longer time, or in *any other manner* than the same is or shall be granted, IS ILLEGAL."

And the 1*st W. and M.* (*st.* 2. *c.* 2. *s.* 13,) declares, "No charter granted before the 23d of October, 1689, shall be invalidated by this act, but shall remain of the same force as if this act had never been made." *No statute has since been enacted invalidating any of the above.* I have now proved by a regular deduction of authorities, the major of my proposition, that "fees of office not of ancient usage, and not authorized by specific Act of Parliament, *are altogether illegal.*"

The next member of my proposition is, that "the fees at present demanded and paid, (for Patents under the great seal) *are* fees neither of ancient usage, nor authorized by any Act of Parliament.

But as this letter may be already too long, I need not make it longer, remaining,

Your's respectfully

VINDICATOR.

Note.—It may be desired by some who *feel* the strength of the expression "*impudent extortion,*" as applied by me in my last paper, to the charge of 18 *l.* 19*s.* made at Mr. Attorney-General's office, for his "bill," that some qualification of the term should be made. I beg to say, that I do not mean at any time the slightest personal disrespect, to the actual holder of that or of any other office concerned in the "*protection*" of genius, by clapping it under the great seal: from *Mr. Yellow-wax* up to *My Lord Keeper* himself. The frequent changes in these cog-wheels and spurs of the political state machine, render personality improbable. My attack is upon the *system*—a system of rank absurdity, oppression, and "*humbug.*"

P. S.—I had forwarded the above before the Journal of March was put into my hands. If Mr. De Jongh will be pleased to refer to his letter of January, he will find that letters patent were considered by him in the nature of a "*reward*" to the Patentee, for the discovery of his invention. I beg to observe, that if Mr. Rayner will do me the favour to read my letter of February, with attention, he will find the principles and leading details of my system developed. It is founded upon the issue, by a competent Court or Board of Commissioners, of annual or triennial licences or protections, paying a *moderate annual* duty to government; and the substitution of effectual security for the uncertainties, insecurity, and expenses of Chancery patents. As my plan embraces a financial object as well as an efficient protection to inventions, its very essence consists in the universal encouragement of *bonâ fide* new discoveries, however trivial, if the *inventors* find them worth prosecuting, at the expense in duty to government, of the annual "protections" or "licenses" to be

issued. I have been for some years engaged in the arrangement of the entire details of a new system, defining precisely the objects, principles of adjudication, and legal powers of a new court, and the order and particulars of its practice and general business. The sanction of the public voice is necessary to the support of any measure tending to the reform of abuses, and the promotion of an extended plan of improvement. The proposal, therefore, of public meetings, to petition Parliament for an effectual revision of Patent laws and practice, and the adoption of an entire new system of protection to inventions,—meets my hearty concurrence. I trust such meetings will be *immediate* and *general* throughout the country. The evils of the present absurd and oppressive system are universally *felt*,—let the appeal against them be *universal*. I most cordially offer the assistance of my best exertions to promote this desirable object, and trust that the scientific gentlemen of London will forthwith put the thing in motion. I have no doubt that every manufacturing and commercial town will follow the example. A complete practical and well defined system of *real* protection to the genius and talent of the community will be the result.

VINDICATOR.

ART. II.—ON THE PATENT RIGHT OF MESSRS. LEWIS, FOR THEIR ROTATORY SHEARING MACHINE. BY MR. J. DUTTON.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—Disappointed at not finding in your last number, any answer to your correspondent, Mr. Rayner's observations on the late decision in the Court of King's Bench, Lewis *v.* Davis, I hand you the following abridgement of what has passed through my mind on that sub-

ject, which, if you think admissible, I shall be happy to find inserted in the next number of your valuable Journal.

If I understand your correspondent rightly, he draws his conclusions chiefly from two arguments—one of which is, that Lewis's machine, being entirely made up of parts of other machinery, previously well known, and in use for the same purpose, it cannot possess any legitimate claims to exclusive right. But it is to the association of ideas, and they must be known before they can be associated, that we are indebted for all our new ones, if we have any, this being in fact the only source from whence they can originate. Things are but the signs of our ideas. It follows then, that a *new* machine may be the result of an original combination of parts, not in themselves new.

It is not my intention, however, to treat the question metaphysically; I shall, therefore, beg leave to state what I conceive to be an analagous use, and leave your readers to draw their own conclusion. Let us then apply, for a moment, Mr. R.'s reasoning to the double acting steam cylinder of the immortal Watt, and melt it down in the same crucible where Lewis's machine has been. Thus,—take from it the formation of a vacuum in iron cylinders, which is the invention of Captain Savary, and as old as the steam engine itself; and the piston, or plunger, which belongs to Newcommon, and what have we left? why truly nothing—nothing BUT the "abstract principle or conception of the junction of two" of Newcommon's cylinders, one of them inverted upon the other. But surely this is not the manner in which the first-rate talent of the age, whether emanating from civil engineers, or the humbler grade of manufacturers, are to be frittered away.

And this brings me to Mr. R.'s other principal argument—that Lewis having specified a rotatory cutter from list to list, which is nothing more than "an abstract prin-

ciple or conception;" and as a patent for a principle cannot be valid, it must of necessity fall to the ground.

It is admitted that a patent for a principle cannot be valid, and for this very simple reason, because it has no reference to any particular mode of construction or action. Now, their specification reads thus:—" And fourth, the described method of shearing cloth from list to list by a rotatory cutter." Nothing can be plainer, and I am quite willing to understand this language, as literally as Mr. R. is pleased to interpret it, where he lays the emphasis upon "their own described method of performing the operation," the previous part of their specification giving a more distinct and clear account of the manner in which the said rotatory cutter is to be made and adapted to the cutting cloth transversly, or from list to list. A great deal of misunderstanding, I apprehend, has originated, in confounding the term principle, as defined above, with the *inherent principle of originality*, which must exist in every Patent, to establish an exclusive right. The abstract conception of cutting cloth from list to list by a rotatory cutter, we may fairly conclude belongs to Lewis; from the circumstance that no attempt has ever been made to establish the contrary.

So much for the *novelty* of the invention—now for its *utility*; the other part of the obligation, under which they have placed themselves, as Patentees. Cutting from list to list, the Patentees have very properly stated to be the best mode of finishing fine goods. Probably, during Mr. R.'s sojourn in Gloucestershire, he never sufficiently informed his judgement, as to the difference which exists in the mode of cutting; provided the face be shorn sufficiently close; a very common, but mistaken idea. There does exist, however, a very essential difference between the cutting of a cloth longitudinally, and transversely; and whether it

be performed by a vibratory, or a rotatory cutting instrument, which I shall now endeavour to explain, as far as it relates to the "junction of two of these old inventions," viz. cutting cloth transversely, and performing this operation by a rotatory cutter; and proves, that the introduction of the machinery constructed on this principle has introduced into the manufacture of fine goods, a new and superior mode of finishing. During the return stroke of a vibratory cutting machine, although that motion be performed in the most minute fraction of a moment, yet it unavoidably happens that portions of the pile or face of the cloth, which should have been taken off, are left on, in consequence of the alternation of the cutting process. Now this is effectually remedied by the Patentee's adaptation of the rotatory cutter, which by its *continuous* cutting, allows no part of the face to escape; and here we are strongly reminded of the "described method of performing this operation," which is a *continuous cutting one*, and as such, a continuous cutting instrument, with its concomitant arrangements, is brought forward as the vendible commodity, operating upon the cloth in a novel direction, and producing a new and beautiful result; and this is what I beg leave to call the inherent principle of originality of Lewis's machine.

The construction of the machinery, by which this continuous cutting is to be applied to the cloth from list to list, the new arrangements of its parts, rendering it totally unfit for cutting the cloth longitudinally, is so clearly specified, in conformity with the conditions on which the grant is made, and so fully explained to the capacity of any competent workman, that it will remain secure amid all the legal warfare that may be set in array against it, setting all attempts at infringement at defiance, until some happy genius shall bring forward a continuous cutter, the edges

of which shall not in their revolution describe a cylinder, nor be indebted for their support to pivots on which the cylinder may revolve.

It will now be readily admitted, that we have a perfectly new organization of machinery, only applicable to its specified purpose, producing, as may be fairly inferred from the immense fortune realized by the Patentees, a new and beneficial effect on the finishing of fine goods. If any corroboration of its beneficial effects were wanting, the writer can bear the most ample testimony, being in the habit of furnishing goods for the London market, in a style not inferior to any manufacturer in the kingdom, and which, he candidly confesses, he could not have carried on to that degree of perfection, independent of the aid of the machinery in question.

With regard to the law of infringement, the best definition I have ever met with is, "that it is the abstracting any specified part from a Patent, and using it for the specified purpose." Now let me ask any competent person, acquainted with both machines, whether there is not, in addition to a too great resemblance in almost every one of its minor parts, the very *modus operandi*, the identical *inherent principle of originality* of Lewis's machine abstracted and applied to the specified purpose, the continuous cutting from list to list? The trifling distinction of causing the cutting part to perform its rotation in an ellipsis, instead of a circle, can never present itself to the understanding of a judge or jury, but as a palpable evasion, a bungling attempt at infringement of a great principle found out and developed by the Patentees, who have so justly and effectually asserted their rights.

The learned judge has, therefore, not attempted any such thing, as an extention of the Patents laws to the protection and security of the "application of method without

means for organization," as asserted by Mr. R. On the contrary, if the ruling of the court over which Lord Tenterden presided had been otherwise than what it was, as he no doubt clearly foresaw, instead of upsetting ten patents, all, be it remembered, infringements on *one* patent, the whole of the immense and valuable patent property of this kingdom would have been laid open; the evil consequences of which would have been incalculable.

I am, Gentlemen, &c.

J. Dutton,

Woollen Cloth Manufacturer.

Wotton under Edge, 19th March.

Article III.—On the Wind Harmonica, and Metallic Spring Reeds for Organs.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—The value of correct information upon every subject of improvement announced in a scientific publication, induces me to hope the following observations may not prove unacceptable. The notice of the above invention in your Journal for this month is accompanied with a statement to the effect, that the first instance of the employment of metallic springs for the reed pipes of organs, occurred in the beginning of this century, when Mr. Flight, by his skilful application of such springs, effected a material change in the construction of organs; and that, through these means, have the instruments constructed by Messrs. Flight and Robson, attained their singular perfection. (Vol. II. p. 344.)

I beg to be allowed to correct the above misapprehension. The mechanical skill displayed by Mr. Flight in the construction of his organs is unquestionable, but he himself will, I am sure, make as little claim to the *invention, or first skilful application* of metallic springs for the reed

pipes, as to the *creation* of the metal itself. Metallic springs, inserted in a peculiar manner in the metal pipes of organs, for the purpose of imitating the sounds of martial and reed instruments, and even of stringed instruments, and of the human voice itself, are of very ancient and general use. From some foreign works, which I have perused upon the construction of organs, I infer, that the introduction of metallic springs for reed pipes took place above three centuries back, and their use became very general in the cathedral and church organs, both on the continent and this country, in the course of fifty years. The very names upon the original stops of the most ancient of these instruments, and the construction of the pipes *with metallic reeds*, prove this. The trumpet, clarion, clarionet, hautbois, cremona, vox-humana, and similar imitative metallic reed pipes, form the *original* stops of some of the most ancient cathedral and church organs, built in this country by old Father Smith, Byefield, and other early makers. Those metallic reed stops are allowed by judges to be, in most instances, *far superior* to any that are made and voiced by the most eminent builders of the present day. Some of these old organs were constructed *with their metallic reed pipes above a century before Mr. Flight was born*, consequently he has, in this respect, not effected *any change* in the construction of organs; and so far from his instruments having attained their singular perfection by such means, I know that he objects to their use, on account of their standing badly in tune with the other usual stops of an organ. Mr. Flight is a gentleman of much general information; he is a skilful mechanic, and possesses a very accurate ear, and sound knowledge of the causes which occasion the difficulty attendant upon keeping reed stops in tune, without having been able to apply any remedy to the defect I believe, that in consequence

of this innate difficulty in the construction of metallic reed pipes, he has introduced only one stop of the kind in that magnificent exhibition of musical and mechanical genius, his Apollonicon.

As to the early use of metallic springs for reed stops in the continental organs, there are several interesting notices in the account of those instruments given by Dr. Burney, in his "*Present State of Music in Germany, &c.*" I shall select two or three from the second edition :—

"The organ of St. Martin's Church, (in Groningen, Netherlands), was built by the famous Zodolpho Agricola, who was born at Bafflon, a village near Groningen, in 1442, but it has received several additions since; however, that part which was of his construction is far the best, *particularly several reed stops.* The vox humana is very sweet, but it resembles a fine hautbois or clarinet, more than a human voice."—(Burney's Tour, vol. 2, p. 283.)

"The organ of St. Peter's Church (Hamburgh) is the most ancient in the town; it is not known when it was originally built; *but the two last manuals* (it has four) were made at Hartzogenbuch, in Brabant, by Mister Nargenhof, in 1548. Some of these stops are excellent, particularly the *vox humana.*" (p. 277.) In the catalogue of the stops of the great organ at Haarlem, built *entirely by Müller*, 1738, Dr. Burney (p. 306) enumerates several reed stops (metallic springs), not known in this country, as the *flag-fluit, schalmay,* ruisch-quint, bazuin, &c.; some of these metallic reed pipes being of the enormous length of 32 feet, and their power, as double basses, tremendous.

Athanasius Kircher was a famous German mathematician and voluminous writer. He was addicted to the study of occult philosophy and hieroglyphics. He was born at Fulde, (A. D. 1601), and after publishing no less than 22 volumes in folio, and 11 in quarto, mostly upon abstruse

and visionary subjects, he died in the year 1680. It is therefore evident, from the preceding notices of organs with metallic springs for the reed pipes, that the idea of the production of musical sounds by the vibration of springs, did not originate with Athanasius Kircher; but it is probable, that he gave the notice in his Musurgia, from his knowledge of the actual application of such springs to organ pipes, as a matter of established practice in his time.

Without wishing to derogate from the value of the modern invention of the *wind-harmonica*, or, as it is designated in another recent account, the Æolina, I beg to surmise, that these instruments, and the application of metallic springs for the reed pipes of organs, however long practised, all originate from the same source—the common jew's-harp. This universally known instrument is formed and intonated precisely on the same principle as the *wind-harmonica*, and the imitative metallic reed stops of organs.

The jew's-harp is described by Sir John Hawkins, in his History of Music, and by several early writers, as one of the most ancient instruments in the world. I apprehend it was the *organ* of Jubal, referred to in Genesis, chap. 4; for it appears to have been derived from the Egyptians, and by the Phœnicians was carried into Greece, and the south of Europe. The merit of the first application of the principle of the jew's-harp, or, if you please, of the wind-harmonica, in a *new form*, to modern keyed instruments, belongs, in my opinion, to Mons. Grenier, a most ingenious and scientific gentleman of Paris, who has constructed new instruments, which he calls "*Orgues expressifs*," which have the great advantage of giving various intonations or powers of tone, according to the degree of pressure upon the wind, without the instrument being out of tune. Mons. Grenier has a *brèvet d'invention* for his discovery, and has been lately employed by the French

government in the erection of a magnificent instrument, upon his new principle, with several improvements, for the use of the *Conservatoire Royale de Musique*, at Paris. I have not had the opportunity of hearing it, but from the effects of the crescendo, and general expression of his small instruments, I judge that the large improved instrument must produce all the effect and musical expression of a well regulated band.

A Mr. Saur lately brought over, or constructed in this country, two keyed instruments, the general effect of which, and the production of crescendo by pressure upon the wind, induce me to think that they are fac-similies of Mr. Grenier's "orgues expressifs." Possibly the instrument to which your notice refers, as designed to accompany the pianoforte, is one of Mr. Saur's. He is now deceased, and his instruments are in the hands of a gentleman residing in the New Road, for sale, with the specification for a patent.

Being now upon the subject of improvements in musical instruments, permit me to add, for the information of your readers, who may feel interested in these matters, that the swell-box has proved one of the most valuable of modern improvements to the organ. It was originally, and is still formed with sliding shutters, which, by means of a pedal, rise and fall; by this motion, a strong effect of crescendo and diminuendo is produced from the inclosed pipes. The swell-box was invented in England, some years before Dr. Burney made his musical tour; it was scarcely known on the continent, when he visited it. Speaking of the grand new organ at Hamburgh, built under Mr. Mattheson's will, he observes, "A swell has been attempted in this instrument, but with little effect; only three stops have been put into it; and the power of crescendo and diminuendo is so small in them, that if I had not been told there was a swell,

I should not have discovered it." (Vol 2, p. 275.) Again, at Amsterdam, the Doctor says, "The organists here have just heard of such a thing as a swell in an organ, but it is difficult to make them comprehend by description, its construction and effect." (p. 294.) A great improvement was made to the swell by the late Mr. Green, who *first constructed* (upon the organ of St. George's Chapel at Windsor Castle), Venetian close blinds, instead of rising shutters. The effect of this improvement is to make the crescendo much more rapid and impressive; it is now generally adopted by all the organ builders of this metropolis. This invention has been likewise erroneously ascribed to Messrs. Flight and Robson; they are, however, entitled to the credit of applying it with most astonishing effect, as their grand Apollonicon proves.

The latest improvement upon organs has been the construction of what are termed, "composition pedals," which draw and return several stops at once, without the necessity of the performer taking his hands off the keys. The merit of this invention was warmly disputed some years ago, before the Society for the encourgement of Arts, between Mr. Flight and Mr. Bishop; but to whomsoever it justly belongs, it is certainly a decided and most ingenious improvement.

I am afraid, that I have trespassed too much upon your valuable miscellany; but as these notices may serve to complete the history of wind-instruments, and remove several current errors, I hope it will not be deemed that I have spent my breath in vain.

ÆOLUS.

March, 1829.

Art. IV. Description of Mr. Lear's new Safety Lamp.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—I need hardly inform you, or your numerous readers, that the *Safety Lamp*, as it is called, of Sir Humphrey Davy, is in many respects very defective, and that, in fact, it frequently produces the danger it is intended to avoid, by a misplaced confidence in its capabilities of protection. Its illuminating power is but small, and when in an impure atmosphere, that power is so far diminished, as to render it of little or no service. This will ever be an inducement to the miner to remove the top, even at the risk of life.

I have invented a lamp free from all these imperfections; it consists of a vessel of the most convenient shape and dimensions, into which I can condense oxygen gas. To this vessel is attached a lanthorn, made perfectly air tight, furnished with a thick glass lens. The lanthorn may be locked to prevent the miners opening it, and the admission of gas is regulated by a screw valve.

Oxygen gas may be obtained at a very little expense, and even if it were greater, the saving of human life ought to be considered greatly to overbalance it. From what I have said, I trust you will be satisfied that this important object can be obtained by the lamp I have described, and remain,

Gentlemen, your's, &c.

Fred. Lear.

No. 2, New Street, Bath Street, St. Luke's.

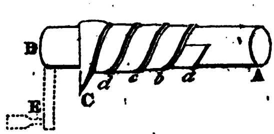
We should feel obliged if Mr. Lear would favour us with a more perfect description of his lamp, and trust that he will do so, in time for our next number, as the safety lamp, if perfectly effective, and free from the dangers which have heretofore attended it, will be hailed as

an extremely valuable acquisition to science, and of the highest importance, both to the proprietor and workmen in the mining districts.—EDITORS.

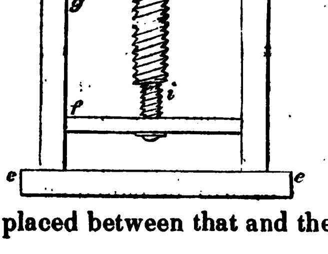
ART. V.—ILLUSTRATIONS OF THE SCREW.

The Editors of the London Journal of Arts, &c.

GENTLEMEN,—Amongst the published contributions to popular science, I have never seen the mechanical powers so illustrated by reference to simple figures, that a plain reader could at once understand their arrangement and use. I now send you a few sketches, that may answer this desirable end, as far as the *screw* is concerned. It is the most complicated of all the mechanical powers; and if I succeed in my endeavours with regard to this important instrument, the others shall immediately follow.

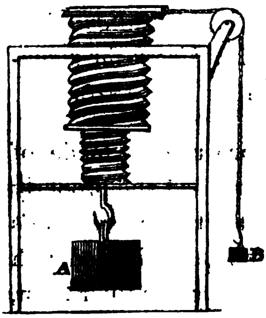


The screw, as is shewn in the accompanying figure, consists of an *inclined plane* C, coiled round a cylinder, A, B, and by its rotation, forms the helix *a, b, c, d.* Now this may readily be represented by the students' coiling a piece of paper round a pencil or ruler. In this arrangement, we have the screw in its simplest state; but, if we add a lever, as is shewn in the dotted figure E, we possess a much more powerful instrument.



In the next figure, the screw is seen, as applied to a press. The base *e, e,* is made to support two uprights, connected with a cross plank *g.* Through this passes a screw *h,* which acting on the moveable plank *f,* tends to compress whatever may be placed between that and the base *e, e.*

If we wish still further to increase the power of the instrument, it will only be necessary to fix a screw *i*, in the lower plank *f*, and letting it pass through a hollow cavity in the upper screw; the threads being of different degrees of fineness, the speed with which the plank is moved will diminish, but the power will increase in an equal ratio. This will, however, be better understood by reference to another figure.



In this diagram two weights are placed in equilibrio, by means of the arrangement already described. The distance of the threads of the interior screw is four-fifths of that of the exterior or perforated screw, and this distance is one-thirtieth of the circumference. Hence the weight B, is capable of sustaining a weight, A, 150 times as great as itself. I need hardly add, that for each revolution of the screw, the weight is only carried through a space equal to the difference between the height of the two coils.

With much respect, I remain, Gentlemen,

Your's, &c.

JAMES BROWN.

Birmingham, March. 20, 1829.

Recent Patents.

To THOMAS WM. CHANNING MOORE, *of the City of New York, in the United States of North America, now residing at Hampstead, in the county of Middlesex, Merchant, in consequence of his having received a communication from a Foreigner residing abroad, of an invention of an improved method or combination of machinery for manufacturing Hats or Caps.*—[Sealed 10th Dec. 1828.]

THE bodies or foundations of hats are usually made of wool felted together, which, when hardened and properly shaped, are covered with the fine fur of the beaver or rabbit's down, or with a shaggy silken plush, and are stiffened with a resinous gum or varnish, in order to preserve their form, and render the hat impervious to rain. These hat bodies were heretofore made by adding together small portions of loose filaments of wool, and working them into a matted or a compact felted state by hand; but latterly there have been several machines employed for that purpose, in which the wool is taken from a carding engine in a thin filamentous sheet, and lapped together, so as to form the required substance. The constructions of machines for this purpose are described as the subjects of Borradaile's Patent (Vol. XI. p. 353, and Williams' Patent, (Vol. XIV. p, 65, of the First Series of our Journal.) The invention, which forms the subject of the Patent about to be described, is for the same purpose, but constructed in a different manner to the foregoing.

SPECIFICATION.

"This invention consists in the construction and employment of a certain arrangement of machinery, by which

a succession of filaments of wool, or any other fit material, are taken from a carding engine, and wound upon a block or mould, for the purpose of forming the shells, foundations, or bodies, of two hats or caps at one operation; the successive filaments of wool being, by the movements of the machine, made to cross each other.

"The shape of the block or mould is cylindrical, about fifteen inches long, and twelve inches diameter, with conical ends extending about ten inches from each extremity of the cylinder, and rounded at their apexes. This mould or block is mounted upon a carriage, which traverses to and fro in front of the doffer cylinder of the carding engine, and at the same time is made to turn upon its axis: the object of which is, that the wool or other material may be uniformly wound upon the surface of the block, and over its conical ends; and when the block has been so covered with the filaments or web of wool, and brought to a sufficient thickness, the matted material is to be cut round the middle of the cylinder, and slipped off each end; by that means producing two caps or shells, which, when felted in the ordinary way, are to be worked into suitable shapes, for the foundations or bodies of hats or caps by the usual means. The block or mould should be as light as possible, that it may easily turn, and not press too heavily on the wool, and for this purpose had better be of light wood, and made hollow.

"Plate I. fig. 1, represents part of a carding engine, as seen side-ways, *a*, being the principal carding cylinder, *b*, the doffer cylinder, from whence the filaments of wool are conducted to the block or mould *c*, mounted on what I call the forming machine. Fig. 2, is an end view of part of the carding engine; *b*, the doffer cylinder; *c*, the block or mould upon its carriage, in connection with the forming machinery; *d*, *d*, *d*, is a frame at the end of the

carding engine, upon the upper part of which there are fixed two iron bars, *e, e*, standing edge-wise. Upon these bars, as a railway, the carriage which supports the block or mould, is to be moved to and fro. Fig. 3. is a plan, or horizontal representation of the frame, with the carriage and the block constituting the forming machine. Rotatory motion is given to the large carding cylinder *a*, by a band and rigger, as usual, and to the doffer cylinder *b*, by any convenient train of wheels, or other contrivance, leading from the axle of the great wheel; and the doffer comb *f, f*, is made to vibrate by a crank shaft, *g*, connected to the train, which causes the guide rods, *h, h*, with the doffer comb *f*, to perform a rapid up and down movement, and by that means to comb off the web of wool in a thin filamentous sheet, which is received into the block or mould.

"Another train of toothed gear, connected to the large carding cylinder, drives a bevil wheel *i*, under the carding engine, from whence a shaft *k*, proceeds, having a mitre wheel at its extremity, for the purpose of driving a horizontal bevil wheel *l*, mounted in the lower part of the frame *d, d*, of the forming machinery. The wheel *l*, has a perpendicular shaft, supported in bearings, and at top carries a crank, *m*, the length or throw of which crank may be extended or contracted at pleasure, by means of a long slot, with the sliding adjusting piece and nut *n*.

"At the extremity of this crank, the rod *o*, is attached by a joint; and the reverse end of this rod is, by another joint, and a perpendicular bar *j*, connected to the traversing carriage *p*, which carriage is supported upon four wheels *q, q*, running on the fixed railway *e, e*.

"Within the frame of the carriage, two cylindrical rollers *r*, and *s*, are mounted parallel to each other, which turn on their axes. The axle of *r*, is a plain rod, sup-

supported by end plates, or staples fixed to the ends of the carriage; that of *s*, is a long cylindrical shaft *t*, *t*, the ends of which are mounted in standards, *u*, *u*, fixed on the stationary frame, *d*, *d*. Upon these cylindrical rollers *r*, and *s*, the block or mould *c*, is placed, which is intended to receive the web of wool for forming the hat bodies.

" In the lower part of the stationary frame, *d*, there is a small horizontal shaft *v*, having a mitre wheel at each end: the one wheel working into the horizontal wheel *l*, (which is its driver); the other into a mitre wheel, at the bottom of the perpendicular shaft, *w*. At the upper end of the shaft *w*, there is a mitre wheel taken into a similar wheel on the shaft *t*, which is the axle of the roller *s*, as above stated.

" The construction of the various parts of the apparatus having been described, I proceed to explain in what manner the forming machinery operates.

" It has been shewn, that by means of gear from the large carding cylinder, the horizontal wheel *l*, is driven, and that through the intervention of the shafts *v* and *w*, and the bevil gear connected thereto, the wheel *l*, causes the long horizontal shaft *t*, to revolve. The roller *s*, is made hollow, for the shaft *t*, to pass through it, and the shaft *t*, has a long groove extending its whole length, in which a tooth or nib, affixed to each end of the roller *s*, acts for the purpose of causing the rollers to turn as the shaft *t*, revolves.

" The roller *s*, being thus made to revolve upon its axis, the block or mould *c*, bearing upon it, is necessarily turned also by the friction of contact, and likewise the roller *r*; and in this way, by the continued revolution, the block or mould is made to take up or wind on to its surface the web of wool, as fast as it is delivered from the doffer cylinder.

"In order that the web of wool may be wound over the ends of the block or mould, as well as the middle parts, the carriage, with the block, is made to traverse to and fro upon the frame *d*, by the rotation of the wheel *l*, which causes the crank *m*, as it revolves, to move the rod *o*, and hence to draw the carriage to and fro, the roller *s*, sliding along the shaft as it revolves.

"Whenever it is wished to cross the wool or other material, more or less, so as to suit different kinds of wool, or other material, or to vary the shape of the hat or cap, the revolutions of the block or moulds are to be quickened or retarded, in proportion to the motion of the carriage. If the revolving motion of the block or mould is quick in proportion to the motion of the carriage, the wool is crossed less than when it is slow, in proportion to such motion. These motions may be varied by altering the size of the mitre wheels.

"Now whereas I am aware, that machinery of different kinds have been introduced before the present time, for making the bodies or foundation of hats and caps, by means of winding a web of wool, or other material, upon a block, in connection with a carding engine; I therefore wish it to be understood, that I do not claim an exclusive right to all the parts of the apparatus, which I have exhibited in the drawing, but only to such parts as are new; viz. the construction and employment of the forming machinery, as shewn; the other parts of the drawing being introduced for the purpose of illustrating the general operation. I therefore claim the following particulars, when adopted and employed, in connection with a carding engine, for winding wool or other material, into the forms or shapes calculated for the bodies or foundations of hats and caps.—1st. The cylindrical block or mould having conical or any other shaped ends, suited to the in-

tended form of the hat or cap, proposed to be made. 2d. The two cylindrical rollers, by which the block or mould is supported and made to revolve. 3d. The shaft and bevil gear by which the roller *s*, is driven. 4th. The adjustable crank attached to the horizontal wheel *l*, and the connecting rod by which the carriage bearing the block or mould is moved to and fro in front of the carding engine, for the purpose of receiving the filaments of wool, and winding them over the surface and ends of the blocks."

[*Inrolled in the Rolls Chapel Office, March,* 1829.]

Specification drawn by Mr. Newton.

To THOMAS ROBINSON WILLIAMS, *of Norfolk Street, Strand, in the County of Middlesex, for his having invented or found out certain improvements in the making of Hats, Bonnets, and Caps, and in the covering of them with Silk and other Materials, with the assistance of Machinery.*—[Sealed 11th Sept. 1828.]

THE subject of this Patent is a mode of hardening the felted hat bodies, after they have been prepared by winding and lapping, in a machine of the kind described in the preceding specification, or by any other contrivance, the operation of which is called planking; and the covering that is attaching the silk plush to the foundation or shell, by means of a new kind of varnish and cement, which is elastic and water proof.

SPECIFICATION.

"My improvements in the making of hats, caps, and bonnets, and in the covering of them with silk and other materials, with the assistance of machinery, consist, in the first place, in a method of felting the shells or foundation of hats, caps, &c. called *planking*, by the means of a machine containing two series of rollers, between which

the bodies of the intended hats, caps, &c. are to be passed, and thereby submitted to the required pressure.

"The construction of the machine for planking will be seen by reference to the accompanying drawings (Plate II.) fig. 1, being a horizontal view, shewing the upper side of the machine, and fig. 2, a vertical section, taken lengthwise through the middle of the machine; *a, a, a*, are a series of rollers, placed horizontally, and parallel to each other, all of which turn upon their axles, in the same direction, as shewn by the arrows; *b, b, b*, are a corresponding series of rollers, placed above the former, and in similar positions, but all of them revolving in the opposite direction to the lower rollers. The axles of each individual pair of rollers are mounted in perpendicular slits in standards, and the rollers are made to press towards each other, either upwards or downwards, by weights or springs applied near to the ends of the axles.

"Each pair of rollers are connected together by a pair of toothed wheels, affixed to their ends, as at *c, c, c, c*, working into one another, and at one end of the axle of each of the lower rollers, there is a bevil wheel *d, d, d, d*, all of which are driven by mitre wheels *e, e, e*, on the lateral shafts *f, f*; these shafts being driven by large mitre wheels *g, g*, on the main rotatory axle *h*, actuated by a band and rigger, or a winch.

"The general construction of the machine being described, I now proceed to explain the manner of using it. The hat body, or any number of hat bodies, having been previously *basoned* or hardened, are by the workmen placed singly or in succession upon the feeding-board *i*, from whence they slide down into the liquor contained in the cistern *k*, and coming in contact with the roller *l*, which revolves on bearings in the cistern, are conducted upwards, and made to pass between the first roller *a*, and the large

roller *m*, and thence proceed onwards between each successive pair of rollers *a*, *b*, until arriving at the roller *n*, at the further end of the machine, their course is turned upwards, and the hat bodies successively falling over, on to the surface of the rollers *b*, are brought back again to the hands of the workman.

"It will now be seen that the inner surfaces or points of contact of the rollers, *a*, and *b*, all move in one direction, and thereby progressively draw the hat bodies forward, which are by these means successively pressed or worked between every pair of rollers, and thereby become shrunk and knitted together, or consolidated into a consistency called felt.

"The upper rollers are pressed down upon the lower rollers, each by a weighted lever bearing upon a metal block, which rests upon the axle near its end; and the rollers are at liberty to rise and fall, as the variable thicknesses of hat bodies pass through the machine.

"The cistern contains a small quantity of sulphuric acid in water, with dregs of beer, or any other liquor, generally used in planking hat bodies by hand. This liquor is heated by a steam pipe *o*, which conducts the steam from a boiler, and discharges it through small perforations in the lower part of the pipe into the cistern, and thereby keeps the liquor constantly hot.

"By this arrangement of the apparatus or machinery, the hat bodies placed on the feeding-board, slide down into the liquor in the cistern, and are thence conducted in any number in succession, or even bearing upon each other, through the several pairs of rollers, and are brought back again over the top rollers, as before described, to the hand of the attendant workman, who stands at the feeding-board to put them through the machine again, if necessary, in different folds and positions, until they are properly felted,

" After the bodies are planked, as above described, they are blocked into shape, and the woven silk or other material, which is to form the external coating of the hat, is attached to the said bodies, by an adhesive composition made of caoutchouc, dissolved in the usual way, with a small proportion of rosin and linseed oil, which constitutes a firm and adhesive cement, and is, at the same time, perfectly elastic and waterproof.

" I claim as my invention, as respects the planking machine, the particular and especial arrangement of the several parts of the same, as described and fully set out in the accompanying drawings; and as respects the covering of hats with woven material, I claim the employment of a composition made of caoutchouc, dissolved by whatever means, and applied to that purpose."

[*Inrolled in the Rolls Chapel Office, March,* 1829.]

Specification drawn by Mr. Newton.

To JOHN BARING, *of Bread-street Buildings, in the City of London, Merchant, in consequence of a Communication made to him by a certain Foreigner residing abroad, for an Invention of a new and improved mode of making or manufacturing Machines for cutting Fur from Skins, for the use of Hatters, to be called " Cant Twist Blades Fur Cutters."*—[Sealed 3d July, 1828.]

THE subject of this invention is a machine to cut the fur from the skins of beavers and other animals, for the use of hat makers, and the particular feature of improvement is the form of the cutter, which is to be made by attaching two blades of steel to a bar of iron, and afterwards twisting the bar, so as to produce a sort of spiral, or what is here called *cant twist blades.*

The invention is set forth in the specification, by a re-

ference to the drawings, (see Plate II.) which exhibit all the parts of the machine in working condition ; the particulars of which are as follow :—

SPECIFICATION.

" Fig. 3, is an elevation of one side of the fur cutting machine, with the said improvement. Fig. 4, is a vertical section taken longitudinally through the middle of the machine, in the same direction as the preceding figure. Fig. 5, is a horizontal view of the machine as seen on the top side, the part called the lever frame being removed, and shewn at fig. 6, the letters referring to similar parts in all the figures; *a, a,* is the wooden frame of the machine, the part *t,* being used to form a box for receiving the cuttings of the skins ; *b,* the standing ledger blade of the shears, supported by being let into grooves in the side frames of the machines, and kept steady by a small spring *c,* let down from the top of the groove, and acting upon the back of the ledger blade; shewn separately and in section, at fig. 7 ; *d,* is the shaft of the new rotatory blade, which from its particular construction, I call a cant twist blade, seen best in fig. 5 ; *f, f,* are balance wheels, attached to the ends of the shaft of the rotatory, or cant twist cutter ; *g, g,* are the feeding rollers, the upper one being mounted in the lever frame *j,* for the purpose of throwing the machine out of gear; shewn separately at fig. 6, and in its elevated position in fig. 4 ; *h, h,* are the pullies running loosely on the shaft of the cant twist cutter, for giving motion to the feeding rollers. These loose pullies are driven by bands *i, i,* passed round them, and round the small fast pullies *k,* fixed on the axles of the main rotatory shaft *l.* One of these bands should be crossed, as here shewn, and the other not crossed, so as to give reverse motions to the feeding rollers ; *m, m,* are cog wheels, affixed to the loose pullies, for the purpose of giving a uniform motion to the

feeding rollers; *n*, *n*, are corresponding cog wheels affixed to the feeding rollers.

Of the cog wheels on the loose pullies, the right-hand one gears into a corresponding cog wheel on the under feeding roller, and the left-hand one gears into a similar cog wheel on the upper feeding roller.

The main motion shaft *l*, is formed with two cranks, from each of which a sweep rod *o*, is suspended, and connected by joints to the treadle *p*. The main rotatory shaft is, by these means, driven by the foot of the workman, and the dead points of action are overcome by the momentum of the fly wheels *g*, *g*, affixed to the ends of the main axle; *r*, *r*, are two small pullies on the axle of the cant twist cutter, which are locked to and revolve with the small balance wheels *f*, *f*; and *s*, *s*, are two bands passed over the pullies *r*, *r*, and the fly wheels *q*, *q*, by means of the rotation of which the cant twist cutters are rapidly driven round; the whole of the machine being by these means actuated by the foot of the workman bearing upon the treadle, as lathes are commonly driven; *u*, is a tin box with a semicircular bottom, which I use to put the cut fur into; *v*, is a tin cover, which, when turned down over the cutter, prevents the dust from flying; and *w*, is the skin about to be shorn.

"Having now described the various parts of the said machine, it only remains for me to describe the position in which the cant twist cutter should be placed with reference to the ledger blade, and the manner of manufacturing the said cant twist cutter; and first of its position, it should be placed behind the ledger blades, with its centre of motion level with the edge of the ledger blade; by this means the revolving or cant twist blades are so elevated above the standing or ledger blade, that in the revolution they have an oblique inclination, or cant upon the standing blade,

which gives them a back bevel to the edges of the cant twist blades, which gives them sharp and better cutting edges. This inclination, or cant of these twist blades, puts them in such a position towards the ledger blade, that the shears do not choak in cutting very thick skins.

"And now as to the mode of manufacturing the said cant twist cutters, it is as follows:—Two steel blades are mounted on two opposite squares of a four sided bar of iron, one blade on each square, as shewn at fig. 8, and then the whole together heated and twisted, to form the cutter, as shewn at fig. 5. The blade may extend one or two inches, more or less, as may be necessary, and tempered to a proper cutting temper in the ordinary way; and it is evident that if required, the bar may be made of more than four sides, and in that case furnished with more blades."

[*Inrolled in the Inrolment Office, Jan.* 1829.]

Specification drawn by Mr. Rotch.

To JOHN HOPPER CANEY, *of Aylesbury-street, Clerkenwell, in the county of Middlesex, for certain Improvements in the Construction of Umbrellas and Parasols.*—[Sealed 21st January, 1829.]

THE particular object of this improvement is to construct the framing of an umbrella with very firm joints, which shall not be likely to give way, that is, allow the framing to break down from any slight accident; and, secondly, a contrivance, by which stretchers of different lengths may be adapted to support the ribs of different lengths, of a square or other peculiarly shaped umbrella.

SPECIFICATION.

"My improvements in the construction of umbrellas and parasols consist, in the first place, in a new mode of forming the joints connecting the ends of the expanding

ribs of an umbrella or parasol to the cap at the top; and also the joints connecting the stretchers with the sliding tube. Secondly, in a new mode of constructing the joints by which the outer extremities of the stretchers are connected to the expanding ribs. And, lastly, in the adaptation of several rings intended to slide upon the umbrella-stick, for the purpose of receiving severally the inner joints of stretchers of various lengths; by which I am enabled to construct umbrellas of a square, or any other form, requiring the length of the several expanding ribs to vary in their dimensions.

The accompanying drawing (see Plate I.) shews the several parts of my invention. Fig. 4, represents the tube *a, a,* to be affixed at top of the umbrella; *b, b,* are two of the expanding ribs; *c,* is the box or socket-piece, in which the joints are made. The upper side of this socket-piece is shewn in the horizontal view, fig. 5, in which one of the ribs is seen inserted into one of the recesses of the socket-piece, having a small pin of steel, or other wire *d,* passed through an eye in the stem of the cap *e,* at the end of the rib (see fig. 6), which constitutes an axle or fulcrum, for the end of the rib to turn upon.

I prefer making the extremities of the pin *d,* wedge shaped, and letting it into corresponding recesses in the socket, for the purpose of preventing the wire from turning, which keeps the joint firm, and does not allow the pin to wear. Fig. 7, shows the under side of the ring cap *f,* which, when placed upon the socket-piece *c,* secures all the joints, as at fig. 4, and is made fast by screws or pins passed through the ring cap *f,* and the socket-piece *c.*

Fig. 8, shows the mode of connecting the stretchers to the sliding tube, which is by precisely the same contrivance as that described above, the socket piece *c,* being in this case inverted.

The mode of attaching the outer extremity of the stretcher to the expanding rib, is shewn in figs. 9 and 10, the latter of which exhibits the whalebone stretcher cut across in section. A piece of thin plate brass, or any other metal, about half an inch broad, is bent up, forming three sides of a square, as shewn at *g*; and another piece of thin plate, brass, or other metal *h, h, h,* is bent round the whalebone rib, and folded in over the sides of the piece *g*. Through the doubles of these pieces, and through the stretcher *i*, a pin is passed, which forms the outer joint that the stretcher acts upon.

Figs. 11 and 12, exhibit the sliding rings to which the inner extremities of the stretchers are attached, when the umbrella is to be made square, or of any other form deviating from the ordinary circular shape. Such a one, I propose, as suited to a chaise or other open carriage.

" The expanding ribs of this umbrella are made of different lengths, that is, those ribs which extend to the corners of the umbrella are longer than those which extend to the straight sides. The stretchers also, which support the ribs when expanded, are of different lengths; and, therefore, when the umbrella is closing, their inner joints must be permitted to slide down the stick. This is effected by attaching the joints to separate sliding rings, as shewn at fig. 12, which rings, when the umbrella is expanded, are brought up, and lock together, as seen in fig. 11.

" Having described my improvements in the construction of umbrellas and parasols, I wish it to be observed, that I claim as my invention—First, the mode of constructing the joints at the inner extremities of the stretchers, and the ribs, by means of a small pin passed through the end of each stretcher and each rib, or the cap piece attached to such rib; which pin is held fast in a socket-piece by means of a cap piece, in the manner shewn in the

several figures of the drawing relating thereto, and which construction of joint is more firm and secure than any joints of umbrellas heretofore made. Secondly, in the contrivance of a socket to be attached to the whalebone rib, by binding plate metal round it in the manner shewn, for the purpose of receiving the outer extremity of the stretcher, and making a firm joint; and, lastly, the adaptation of several sliding rings, to which the inner joints of certain of the stretchers are to be attached, when an umbrella is required to be made of a square or oblong figure.

[*Inrolled in the Rolls Chapel Office, March,* 1829.]

Specification drawn by Mr. Newton.

To Benjamin Rider, *of Redcross Street, Southwark, in the County of Surrey, Hat Tip Manufacturer, for his Invention of certain Improvements in the manufacture of Hat Tips, which he intends to denominate Rider's Patent Hat Tips.*—[Sealed 17th July, 1828.]

The subject of this Patent is a new compounded material, intended principally to be employed for making the circular tips, by which the crowns of hats are stiffened and kept in their proper shape. The hat tips, as they are commonly called, have heretofore been made of pasteboard or card, or some such substance, susceptible of imbibing damp, which is considered to be objectionable. The improved hat tip is made of materials impervious to water, and therefore possess the advantage of resisting damp. The particulars are as follow :—

SPECIFICATION.

"My invention of certain improvements in the manufacture of hat tips consists in the constructing or making of a new material or substances composed of some of the articles from which brown paper is commonly made, combined with cork in a pulverized or granulated state, which

material, when manufactured into sheets or boards, something resembling millboards, is particularly calculated for hat tips, and may be also applied to a variety of other useful purposes.

" In preparing this new material, I take of the pulp or felted fibrous vegetable matters, of which brown or whitey brown paper is commonly made, about seventy-five pounds, when in a dry state, and having worked this in the mill or vat, as paper makers usually do, I then add about thirty-five pounds of pulverised or granulated cork, which is to be so perfectly mixed or blended with the pulp in the mill or vat, so as to form one compound substance. These proportions of quantity may, however, be slightly varied, without materially altering the articles intended to be produced. This substance is then to be moulded, either by hand or machinery, in the same way that sheets of brown paper or millboards are commonly made, carrying it through the usual operations of couching, pressing, and drying.

" This material, when thus made, being finished, is a sort of compound of cork and paper, the sheets of which are to be cut into circular pieces for the tips of hats; but I do not propose to sell it at all times in that form, but in sheets to be cut at pleasure to the dimensions required by hat-makers. In some cases, I coat the material on one or both sides of its surface with varnish, of the kind commonly employed by hat-makers for stiffening the shells or foundations of hats.

" This material may be applied to making the entire body of the hat, either by moulding it from the vat to the proper shape, or by cutting the sheets, and joining their edges together with cement. It may also be applied to various other purposes, such as hat boxes, muff boxes, and other boxes and envelopes for preserving packed goods

from damp; and in some cases where it may be desirable to prevent the ravages of moths, I mix with the above materials in the vat, a small quantity of pulverised cedar wood. It may be necessary to add, (that the cork or the cedar wood must be reduced by grinding in a ginger mill, or between stones in a flour mill; but I do not confine myseif to any particular machine for grinding, but pulverise it in any or the best way that circumstances may dictate.

[*Inrolled in the Rolls Chapel Offiee, January,* 1829.]

Specification drawn by Mr. Newton.

To George Rodgers, *of Sheffield, in the county of York, Cutler,* Jonathan Cripps Hobson, *of the same place, Merchant, and* Jonathan Brownill, *of the same place, Cutler, for their having invented certain Improvements on Table Forks.*—[Sealed 23d Dec. 1828.]

This invention is the attachment of two file-edged pieces to a carving fork, which are to stand in angular positions, for the purpose of sharpening the edge of a carving knife, by drawing its blade to and fro between the angular junctions of the file edges.

SPECIFICATION.

" We do hereby declare the nature of our said invention to consist in the introduction of flat pieces of steel, or other hard metal, serving the double purpose of guards and whetters, or of whetters only, within or through the shank of such forks as are used at table, whether carvers or others, in such manner as will admit of such knives as are used at table being sharpened or whetted thereon at pleasure, such flat pieces of steel, or other hard metal, being curved at the sides, so as when separated for the purpose of use, to form a similar angle at every intersec-

tion between them, thereby being better calculated to improve the edge of the knife than if the sides of the said pieces of steel or other metal were straight. But the faces of the sides of the said pieces of steel or other hard metal are flat, and striped like a steel, or cut with a chisel, in the same manner as a file; and which said pieces of steel, or other hard metal, may be introduced into or through the shank of such fork, either with or without a steel spring, of a circular or other convenient form, the object and effect of the said spring being to confine the said pieces of flat steel, or other hard metal, and to press them close together within the shank of the fork in which they are placed.

" Plate I. fig. 13, represents a side view of a fork, with two of the said pieces of steel, forming at once a guard and whetters; *a*, *b*, are two flat pieces of steel, about one-twelfth of an inch in thickness, turning somewhat stiffly on the pin or pivot *c*; these pieces of steel are so shaped or curved at their sides, that on being fixed or secured together with the pin or pivot *c*, however far apart or near their point may be, the angle formed by their intersection shall be similar, for their whole length from that part where the angle is first formed by intersection to the point; and thus it follows that as the curve is varied by the manufacturer, so will the angle of intersection be altered to that which he may think best suited to his purpose.

The faces of the sides of these pieces of steel or metal are flat, and may be made with a plain surface, or cut with a chisel like a file, or striped like a steel; provided always, however, that the two faces which together form any one of the angles are, if they are cut as aforesaid, not to be cut in the same way, but in contrary directions, one of them being, as is generally termed in the file trade, up-cut, upon the face of the side of the whetter.

"We have only shewn, in fig. 13, two pieces of flat steel or metal, as forming the guard and whetters, but more might be used, to suit the fancy of the manufacturer, and the shape of the pieces might be varied, as shewn in fig. 15, and may be made also in a variety of other forms.

"The pieces of steel or metal are made to turn, somewhat stiffly, on the pin or pivot *c*, by using one or more small springs, made of steel or other hard metal, with one or more washers, or small pieces of copper or other soft metal, the spring or springs being fixed on either or both fronts of the flat pieces of steel or whetters, and secured or fastened by the pin or pivot *c*, which springs and washers we are not able to shew in fig. 13, as they are made to fit within the shank of the fork; but they are shewn in fig. 17, and may be made in other forms or ways. Figs. 14 and 16, shew the back views of the fork, with the opening in the shank and the pin of pivot *c*, to receive the flat pieces of steel or metal, and also the spring or springs, and washer or washers.

"We would here observe, that instead of the pin or pivot *c*, and the springs, a screw may be used for the purpose of attaching the flat pieces of steel or metal, used as a guard and whetters to the fork, and also the spring or springs, washer or washers, though perhaps not with such good effect; the whetters, when attached by a screw alone, being liable, by frequent opening, to turn too easily to be used with advantage.

"It only now remains for us to state the manner of using the said improvements, for the purpose of whetting or sharpening knives, their application as guards being self evident.

"In order to sharpen a knife, it is only necessary to open or separate the flat pieces of steel or metal plates *a*, *b*, as shewn in fig. 13; draw the edge of the knife a few times toward you, at the point of intersection of the said plates

a, and *b*, as if it were the intention of the operator to cut through the flat pieces of steel or metal in that direction; and this action will sharpen the knife sufficiently for ordinary purposes.

"Now whereas we claim, as our invention, the introduction of such flat pieces of steel or other hard metal, as aforesaid, within or through the shank of the fork, in manner and for the purposes aforesaid."

[*Inrolled in the Inrolment Office, February,* 1829.]

Specification drawn by Mr. Rotch.

To William John Dowding, *of the Parish of Poulshot, in the County of Wilts, Clothier, for his invention of certain Improvements in machinery for rolling or rollering Wool from the carding engine.*—[Sealed 22d November, 1827.]

In order to understand the subject of this Patent, it is necessary to explain that part of the operation of preparing and spinning wool to which it applies.

The filaments of woolhaving beenseparated, and in a sort of way combed out and brought into a thin sheet or sliver, by the ordinary scribbling or carding engine, that thin sheet or sliver of wool is further operated upon by an extension of the carding engine, and is ultimately discharged therefrom, by the doffer comb striking off small portions of the sliver of wool from the fillets of cards on the doffer cylinder, in breadths of about six inches, and in horizontal lengths of about thirty inches, which is the ordinary width of the cylinders of the carding engine.

These portions of wool are conducted by the doffer comb into a semi-cylindrical box or trough, at the end of the carding engine, in which a fluted roller revolves; and these flutes taking hold of each doffed portion of the wool, as it descends into the trough, rubs it round and rolls it into the

form of a round rod, called a roll or roller of wool, and delivers it out of the trough, on to a traversing table or endless cloth.

Thus a rapid succession of rolls or rollers of wool are turned out of the engine in horizontal lengths, which are carried by children to the slubbing machine or billy, in which the slubbing, or first process of spinning, is effected.

The mode of feeding the billy or slubbing machine with wool, is by placing the rolls or rollers side by side, in longitudinal directions upon an endless feeding cloth inclined upwards, which is mounted on rollers at the front of the billy; and this feeding cloth being made to traverse, carries forward the rollers of wool towards the spindles, advancing so much at every stretch or traverse of the carriage, in which the spindles are mounted, as is necessary to supply to each spindle the portion of wool required to be extended and spun into the roving, or first condition of loose twisted yarn.

Now as the rollers of wool discharged from the carding engine are not more than about thirty inches in length, it is necessary that they should be frequently supplied to the machine, and the extremities of the fresh rolls carefully joined to the ends of the preceding rolls. This is done by children, who constantly attend the machines, carrying the rolls of wool from the carding engine, and joining them to those in the slubbing machine. But this joining of the ends of the rolls of wool is attended with inconvenience, as if too much of the end of one roll over-laps the end of the other, the yarn or roving drawn from it will be gouty or irregularly thick in parts; or, if the junction of the two ends is not sufficiently perfect, the yarn or roving will be in some parts too thin, and probably break in stretching. Such, however, is at present the universal practice in pre-

paring roving of wool; and to obviate this inconvenience, is the object of the present Patent.

The improved apparatus is to be attached to a carding engine, which is to be of the ordinary construction, with the exception of the form in which the wire cards are to be placed upon the doffer cylinder. Instead of fillets of wire card, about six inches broad, extending the whole length of the cylinder in the direction of its axis, it is proposed to place the cards in rings round the periphery of the cylinder, and by means of the doffer comb, to strike off the wool in continuous strips or ribbons of sliver, which are to be received on to an endless traversing table or cloth. The edges of the rings of wire are to be guarded by rings of stout leather; but this part of the apparatus is not claimed as new.

The novelty in the apparatus consists in placing another similar endless traversing cloth upon that which receives the strips or ribbons of sliver, so that the sliver may be carried forward from the carding engine, between the two cloths; and while they are thus conducting it, a lateral motion is given to the upper cloth, which causes the strip or ribbon of sliver to be rolled up from its previously flat form, into that of a round rod or roller.

This plan of producing endless rollers of wool from the carding engine, by means of the lateral motion given to the endless cloth or other surfaces, between which the sliver may be conducted and rubbed, is claimed as a principle, by whatever modification of machinery iseffected.

The mode described in the specification, is by mounting the upper endless cloth upon rollers, and giving it the same progressive motion as the lower cloth, by means of pullies and cords in the ordinary way; the rollers of the upper cloth being mounted in a carriage upon small wheels, which by means of a rotatory crank and connecting rod, is

made to traverse to and fro in lateral directions, in which lateral movements the sliver becomes rolled up by the friction of the two surfaces of cloth.

In order to take a sufficient quantity of wool from the carding engine, it is proposed that two or more doffer cylinders should be employed in connection with the large carding cylinder; and of course, that the rings of cards on one should be opposite to the blank spaces on the other. In this case, the doffer cylinders must be one above the other, and separate endless traversing cloths, mounted in the way described, adapted to receive the sliver from each doffer cylinder. From the endless cloths, the rollers of wool will fall in continous lengths into boxes, cans, or other receptacles below; and from these cans, or other receptacles, when placed in front of the billy, the rollers of wool may be afterwards drawn, as required, to supply the spindles of the machine in preparing the rovings, without the inconvenience of joining the short rollers together by the hands of children, as above described.—[*Inrolled January*, 1828.]

To Frederick Foveaux Weiss, *of the Strand, in the City of Westminster, and County of Middlesex, Surgical Instrument Maker, for his Invention of certain Improvement in the Construction of Spurs.*—[Sealed 6th Nov. 1827.]

The object of this improvement is to enable spurs to be attached to the heels of boots or shoes, by means of a catch in the heel, instead of straps bound round the foot, as heretofore. A socket is to be let into the solid part of the heel, and the reverse end of the stem to that to which the rowel is attached being introduced into the socket, is by that means held fast, and secured to the foot.

Plate I. fig. 18, is a section of the socket, the end view of which is shewn at fig. 19. The socket, which is cylindrical, being let into the solid part of the heel, is secured thereto by screws passed through the rings. The entrance of the socket is at *a*; and the piece that closes the aperture, for the purpose of excluding dirt, is attached to a tube sliding within the socket, which is pressed up to the aperture by a spiral spring introduced into the socket from the back part.

Fig. 20, is the stem of the spur, carrying the rowel; at the reverse end of the stem is the plug *e*, which fits into the socket. The plug is cylindrical, but flatted on one side (see fig. 21), for the purpose of enabling it to pass into the aperture. The plug, on entering, pushes back the piece *a*, and at the same time compresses the spring *d*, within; and, when it is passed nearly home, the stem is turned round, which brings up the notched part of the plug, and locks it against the segment piece *e*, fixed at the upper part of the entrance of the stem.

In order to remove the spur that is, withdraw the plug of the stem from its socket, the stem must be turned round, so as to bring the flat part of the plug uppermost; the force of the spring will then project it out, and the piece *a*, close the aperture.

Another mode of fixing the stem into the socket is by a spring catch, as shewn in fig. 22; *a*, is a spring ratchet let into the plug, which, when the plug is inserted, takes hold of a corresponding ratchet in the socket, and holds it fast. To withdraw the stem, the lever *b*, of the spring ratchet must be depressed.

When it is required to attach a metal horn, or semicircular part of the spur which shall embrace the heel, that must be done by passing the plug through a hole in the middle of the horn, and making it fast to the stem by

a small screw, after the spur has been affixed to the boot or shoe.—[*Inrolled January*, 1828.]

To Thomas Stirling, *of the Commercial Road, Lambeth, in the County of Surrey, for certain Improvements in Filtering Apparatus.*—[Sealed August 16, 1828

One of the leading features of this invention, appears to be the construction of vessels which are to be employed for filtering water for domestic uses, by combining slabs of slate, and the other is passing the water upwards in a zigzag course through layers or beds of sand and other purifying matters.

These slabs of slate are to be cemented together at the joints, by a mixture of white lead, or a strong mortar, made of lime; and the slabs are to be further supported and braced together to prevent their separating, by rods of iron passed through the vessel, and secured by nuts screwed on the outsides.

The form of the vessel is proposed to be square, or at least rectangular, and about twice as high as the breadth of the base, the internal part being divided into five compartments, by gratings or perforated plates.

The water is to be introduced into the lowest compartment, by a pipe leading from a reservoir, placed in an elevated situation, in order that the pressure from above may cause the water to rise through the filterer to the top.

The lowest compartment or receiving vessel is covered by a grating, upon which, occupying the second compartment, a quantity of sand is placed. The water is therefore to percolate through the sand upward, and deposit any foul matter with which it may be impregnated in the bed of sand.

Above the second compartment a plate is fixed, with

conicle holes in the centre, through which the water is made to pass, by the upward pressure, into the third compartment, which is likewise filled with sand. The plate above this third compartment is perforated towards one side only, so that the water, in passing upwards, has to proceed through the bed of sand, partly in a horizontal direction.

The fourth compartment is occupied with sand and carbonacious matter, such as broken pieces of charcoal, or burnt brick, or unglazed pottery ware, which not only takes up the foul matter mechanically, but also acts chemically upon the water, to sweeten and purify it from any putrid animal matter which it may contain. The plate above the compartment is perforated with conical holes towards the opposite side to the lower plate, for the purpose, as before stated, of causing the water to percolate through the bed, partly in a horizontal direction, and by thus giving it a zigzag course, to bring it in contact with a more extended bed of the purifying material than it would be exposed to if it passed directly upwards.

The fifth compartment contains broken pieces of slag from the Carron foundry; (we presume any other iron foundry would do as well), and from this compartment, which is at the top of the filtering vessel, the purified water is to be drawn off for use.

In constructing a filtering apparatus of large capacity, it is proposed to make its sides with brick, or in some cases with iron, properly secured together.—[*Inrolled February,* 1829.]

New Patents Sealed in 1829.

To George Haden, of Trowbridge, in the County of Wilts, Engineer, for his having invented certain improvements in machinery for dressing cloths. Sealed 2d March—6 months.

To William Storey, of Morley, in the Parish of Batley, in the County of York, Plumber and Glazier, and Samuel Hirst, of the same place, Clothier, for their having discovered certain materials, which, when combined, are suited to be employed in scouring, milling or fulling, cleansing, and washing of cloths and other fabrics, and by the employment of which material, considerable improvements in those processes are effected. 10th March—6 months.

To Richard Hall, of Plymouth, in the County of Devon, Tailor and Woollen Draper, for his having invented a composition applicable to certain fabrics or substances, from which may be manufactured boots, shoes, and various other articles. 10th March—6 months.

To James Wills Wayte, of Drury Lane, in the County of Middlesex, Printer, for his having invented certain improvements in printing machinery. 19th March—6 months.

To William Church, of Birmingham, in the County of Warwick, Gentleman, for his invention of certain improvements in buttons, and in the machinery or apparatus for manufacturing the same. 26th March—6 months.

French Patents

GRANTED LAST QUARTER, IN OCTOBER, NOVEMBER, AND DECEMBER, 1828.

To Lalanne, Professor, La Fleche, for an instrument he calls "Secatuor perspectif." 5 years.

— Thiriet. Raucourt, for improvements in buckles. 10 years.

— Augustin Paul, Paris, for mechanical boot or shoe forms. 5 years.

Antoine Preynat, Sorbier, for a loom batt, to weave ribbons. 5 years.

Pierre Pelletan, Paris, for a new mode in manufacturing soda carbonate. 15 years.

André Alexis Leture, Paris, for a new apparatus, "calorifire-helicoïde." 15 years.

Antoine Huet, Paris, for a new waterwheel and pumps. 10 years.

Bernard Lassimone, Limoges, for an instrument he calls "taille crayon." 5 years.

Jean Jacques Herbault, Paris, for a carriage. 10 years.

Victor Grandin, Elbuef, for improvements in brushing machines, &c. 15 years.

Antoine Martin, Nimes, for a moving power he calls "universel." 5 years.

Denis Peyre, St. Etienne, for a double shuttle loom. 5 years.

Millirour and Jackson, Paris, for machinery to dress hats. 5 years.

Leonard Bricaille, Paris, for the application of steam in the working of horsehair. 5 years.

Jean André Taitovin, Alais, for a machine to draw silk. 5 years.

Léonard Bal, fils ainé, Lyons, for a mechanical loom batt. 10 years.

Abadie, père et fils, Toulouse, for a shearing or cropping machine, "finissuise." 10 years.

Hubert Felix, Palley, Paris, for a filtering coffee pot. 5 years.

François Armand Caron, Paris, for improvements in the hydrostatic lamps. 5 years.

Waddington, freres, and Champion, St. Remy, for spinning spindles. 5 years.

Pierre Crepu, Lyons, for improvements in high pressure steam engines. 15 years.

Joseph Romer, Paris, for a sharpener he calls "contremorfil." 5 years.

Pierre Isidore Bertin, Paris, for a system of toothed wheels. 15 years.

Guillaume Gartaigne, fils, Paris, for a moving power he calls "balance-ventilator." 10 years.

Joseph Aubril, Paris, for an unctuous soap. 5 years.

Antoine Galy-Gazalas, Versailles, for improvements in his aerostatic lamp. 15 years.

Louis Benjamin Lagrange, Paris, for a process to clarify liquids. 10 years.

Edine Toussaint Varnier, Paris, for a new method of "gauffrage." 10 years.

Louis Roth, Paris, for a process to evaporate syrups. 15 years.

Joseph Antoine Grandval, Paris, for new sugar-filters. 5 years.

Thomas W. Ch. Moore, New York, for new improvements in manufacturing hats. 15 years.

Lambert Roche, St. Etienne, for a new ribbon loom batt. 5 years.

Jaques François Allard, Paris, for an atmospheric lamp. 5 years.

Louis Muré, Marseille, for a process to refine sugar. 5 years.

Antoine Dominique Sisco, Paris, for a series of tools he calls "monte-ressort-boôte." 5 years.

Hippolite August Dupont, Rouen, for a new method to read he calls "citolégre." 5 years.

Debezis, Paris, for a process to prevent the sinking of boats. 10 years.

William Church, Birmingham, for machinery to manufacture nails, &c. 15 years.

Mathiew Fargires, St. Etienne, for a ribbon loom batt. 5 years.

Michel Challot, Paris, for improvements in washing gold and silver cinders. 5 years.

Jean François Pascal, St. André, for a mechanical process to learn to read. 5 years.

Nicolas Delandes, Paris, for a night lamp he calls "à reflet." 5 years.

Lemaire d'Angerville, Paris, for an apparatus he calls "pneumato-nautique." 10 years.

Vallery et Perrot, Rouen, for a machine to pulverise dye-wood. 15 years.

Douet Jeune, Tours, for a paste he calls "analeptique." 5 years.

Laurent et Trefron, Paris, for a process to improve lamps. 5 years.

Borguet-Lameleir, St. Eloi, Rouen, for a machine to level iron rollers. 5 years.

Hubert Foubert, Rouen, for a lamp he calls "pneumatique." 5 years.

François Grilles, Nimes, for a process in weaving figured stuffs. 5 years.

Hirrier-Bonnefort, Toulon, for a method he calls "Technicographie instantanée. 10 years.

Samson Riccardo, London, for a method to regulate heat. 15 years.

Pierre Joachim Rognot, Airey-le-Duc, for a process to convert cast iron into wrought iron. 10 years.

Antoine Leopold Cheradame, Paris, for a new mode to give light. 15 years.

Jean P. François Collain, Sabran, for a serpentine chimney, &c. 15 years.

Samuel Clegg, Liverpool, for a steam engine and a steam generator. 10 years.

Louis Lacomb, Paris, for a method to learn to write. 5 years.

Maire et fils, Poutroie, for a method of weaving plain and figured goods. 10 years.

~~Louis Alexis Hallette, Arras, for a steam engine he calls "ma-~~ chine navale." 10 years.

Henry Hunt, Paris, for a composition of ink. 5 years.

Henry Hunt, Paris, for a new shoe-blacking. 5 years.

Laimgruber, Paris, for a coach he calls "balance coach." 5 years.

Jean Francis Sudre, Paris, for a musical language. 5 years.

Jean Sagnard, St. Etienne, for a ribbon loom batt. 5 years.

Morrin, Paris, for a grating to roast chops without smoke. 5 years.

Pierquin et Mazel, Paris, for a paper they call "salsifrage." 5 years.

Jean Zerr, Paris, for horse-hair shoes. 5 years.

Poupart de Muflize, Sedan, for an atmospheric motion, or paradoxal machine. 15 years.

Nicolas Langouffle, Paris, for a "tric-trac roulette." 5 years.

François Sazet, Bourdeaux, for a hydraulic machine. 5 years.

Castera, Paris, for sundry apparatus of submarine navigation. 5 years.

Joseph Pergier, St· Etienne, for a ribbon loom batt. 5 years.

Louis François Ducondray, Paris, for an ornament in hair dress. 5 years.

Jean Bernhard Filhol, Paris, for a surgical instrument. 5 years.

~~Anselin, Paris, for a moving book binding. 5 years.~~

Linden-Thiry, Metz, for a sort of a felt, to use in cravats. 5 years.

Jean Weber, Paris, for an instrument to cut pens. 5 years.

Henry Vincent Pelicier, Mus, for a new game of cards. 5 years.

CELESTIAL PHENOMENA, FOR APRIL, 1829.

D.	H.	M.	S.	
1	2	0	0	☿ in conj. with φ in Aquar.
3	10	21	0	Ecliptic conj. or ● new moon
4	5	0	0	☽ in conj. with o in Pisces.
5	0	0	0	Clock before the ☉ 2' 48"
6	23	0	0	☽ in conj. with 1 δ in Taurus
7	0	0	0	☽ in conj. with 2 δ in Taurus
7	5	0	0	☽ in conj. with α in Taurus
9	16	0	0	♂ in conj. with Δ in Taurus
10	0	0	0	Clock before the ☉ 1' 22"
10	14	7	0	☽ in ▭ first quarter.
12	5	0	0	☽ in conj. with 1 α in Cancer.
12	6	0	0	☽ in conj. with 2 α in Cancer.
12	23	0	0	☽ in conj. with ξ in Leo.
13	4	0	0	☽ in conj. with σ in Leo.
13	14	0	0	☽ in conj. with π in Leo.
15	0	0	0	Clock before the ☉ 3"
15	12	0	0	☽ in conj. with τ in Leo.
15	20	0	0	♂ in conj. with ζ in Pisces
16	23	0	0	♀ in conj. with 2 η in Taurus
17	18	0	0	☽ in conj. with θ in Virgo.
18	18	22	0	Ecliptic opposition, or ○ Full Moon.
19	1	0	0	☾ in conj. with η in Virgo.
19	21	7	0	☉ enters Taurus.
20	0	0	0	Clock before the ☉ 1' 8"
20	16	0	0	☾ in conj. with γ in Libra.
21	0	0	0	☾ in conj. with θ in Libra.
21	17	0	0	☾ in conj. with φ in Oph.
22	18	0	0	♀ in conj. with o in Pisces
25	0	0	0	Clock before the ☉ 2' 8"
26	7	55	0	☾ in □ last quarter.
27	1	0	0	☿ in conj. with σ in Pisces.
27	21	0	0	☾ in conj. with θ in Aquar.
30	0	0	0	Clock before the ☉ 2' 55"

METEOROLOGICAL JOURNAL, FOR FEBRUARY AND MARCH, 1829.

1829.	Thermo.		Barometer.		Rain in inches.	1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.			Hig.	Low	Hig.	Low.	
FEB.						MARCH					
26	39	31	30,04	29,85	,025	12	47	26	29,72	29,66	
27	41	35	30,25	29,96	,425	13	46	30	29,72	29,61	,1
28	27	28	30,26	Stat.		14	42	20	29,83	29,76	
MARCH						15	43	20	29,86	Stat.	
1	34	20	30,15	30,06		16	42	21	29,76	29,63	
2	35	29	30,16	30,06		17	45	19,5	29,50	29,47	
3	39	31	30,25	Stat.		18	53	25	29,66	Stat.	
4	41	32	30,12	30,06	,05	19	63	40	29,69	30,50	,075
5	45	29	30,14	30,10	,025	20	59	47	29,72	29,54	
6	46	36	30,03	29,96		21	57	37	29,05	29,98	
7	47	36	29,96	Stat.		22	56	30	29,86	29,76	,1
8	47	37	29,93	29,90		23	51	36	29,82	29,62	
9	40	35	29,83	29,80	,025	24	44	35	29,86	29,64	
10	48	28	29,81	29,80		25	48	20	29,86	29,83	
11	44	28	29,81	29,74							

THE

London

JOURNAL OF ARTS AND SCIENCES,

No. XIV.

[SECOND SERIES.]

Original Communications.

Art. VI.—On the Committee of Inquiry upon the Law and Practice of Patents.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—We may at last congratulate the scientific and mechanical portion of the community upon the actual appointment of a Parliamentary Committee, for the purpose of investigating a subject which may be justly deemed one of the highest importance. The increasing necessity of enabling our manufacturers to compete in foreign markets with the progressive efforts of rival nations—the just appreciation of the consequences which must result from the ardent, effectual, and systematic encouragement offered, by neighbouring governments, to every exertion of talent which may tend to the perfecting of their native branches of industry, whilst ours remain

without a similar fostering protection—the importance of rightly determining what measures shall most surely promote, and most effectually secure, in future, the industry and talent of our own population, when an alteration is contemplated of a system which has too long bowed down and oppressed the exertions of genius,—these, and other weighty reasons, render it of the utmost immediate consequence to ascertain the *principles* upon which an amendment of our Patent laws should proceed, or the substitution of a better and entire new system be founded.

The confined views which appear to me to be held by some of the leading members who have spoken upon the appointment of the Committee, as to those *principles*, induce me to ask the indulgence of your numerous readers for the postponement of the argument upon the charges and fees of Letters Patent, and the substitution of the present observations in your next Journal. I hope it will not be deemed that I transgress the limits prescribed for the discussion of the opinions of our representatives delivered in the senate, whilst I respectfully claim my right as a constituent, freely to animadvert upon them.

Mr. Lennard, the Honourable Mover for the Committee of Inquiry, very ably introduced the subject with a short history of monopolies in the reigns of Elizabeth and James, *and a due parliamentary courtesy towards* "*prerogative.*" Now, as the honourable member allowed that the *constitutional* interference of Parliament then checked the peccadillos of *prerogative*, "*which had been long and repeatedly turned to the hurt of the people,*" I apprehend that parliamentary interference with the present uses made of *prerogative*, for the benefit of its state officers, by loading the grant of Patents with enormous charges, illegal demands, and endless trouble, *to the present hurt of the people*, may be equally necessary and *constitutional* now as it was then.

If the reported speeches are correct, Mr. L. continues—" He should not say any thing in regard to the expense of taking

out a Patent; he had heard it spoken of as a grievance, but he was not prepared to say that the law required any alteration in that respect. It was his own opinion at present, and he knew it was the opinion of many persons, who had great experience in that part of our laws, that it was not desirable to facilitate over much the obtaining of Patents, by *any* reduction of expense."

As an echo to this (I beg to say extraordinary) position, the Right honourable Secretary of State for the Home Department is reported to have observed, that "He thought that care should be taken to prevent the appointment of a Committee being considered as sanctioning an erroneous impression, which was unfortunately very general—that it was expedient to facilitate the taking out of Patents for inventions. This was a great error. He was convinced that too great a facility to the obtaining of Patents would actually defeat the end intended by them, and thereby prove mischievous to the mechanical and manufacturing interests of the country."

Without entering at present into the question of the correctness of the views of these honourable gentlemen, either as to the expenses of a Patent being part of "*our laws*," which, saving the duties charged upon the several documents by *Act of Parliament*, I maintain, and will in a future number demonstrate, are levied *contrary to law, and by an illegal extension of the prerogative*; or, as to an erroneous impression being generally entertained by men of research, science, skill, and reflection, upon subjects in which they are conversant, and which they generally assert to be an intolerable grievance, I broadly assert, that the position maintained in this doctrine, of the inexpediency of facilitating the taking out of Patents for inventions, *directly involves the principle of non-protection to the actual property of the subject, and the exclusion, so far as the principle operates, of every man from the fundamental compact of society.* Absolute and entire protection to property, without reference to the plus et minus of its amount, forms one of the principal claims which every

member of a community has upon it, or rather upon those who are pleased to undertake its direction and *state*. This principle is fundamental and inherent to the constitution of every society. The man who feloniously takes the smallest amount of property, thereby renders himself equally amenable to the offended law as the daring culprit who robs to the greatest amount. He who steals sixpence, and he who carries off a noble lord's service of plate, are equally guilty in the eye of the law. The social compact would be virtually destroyed, were it not for the universality of the extent of the protection it offers to *all* property. We will apply this indefeasible principle to the subject in hand. The property which a man has in the produce of his labour is of inherent right, antecedently existing to any relative engagement, actual or implied; because if the right did not first exist, he could make no contract in respect of it. The intellectual labour or skill employed in any known manufacture or process, is that which forms the intrinsic value of the matter operated upon, as contra-distinguished to the raw materials and manual labour employed. Intelleetual labour, independent of the mere manual operation, thus exhibited, therefore becomes a matter of property, because it affixes a new and actual value to the material; consequently, as a matter of property, it claims the rights of, and protection extended to property. Now, the intellectual labour bestowed on the production and exhibition of an entire new discovery, invention, or improvement, is precisely of the same order (although differing in degree), as that bestowed in the completion of a known process, and is therefore a matter of inherent property in the inventor, antecedent to any implied or actual compact in regard of it, and under the equal universal protection of the law; *all* intellectual labour, when exhibited in new inventions or discoveries, therefore entitles the inventors to that protection, without reference to the value or estimated benefit to the community of the invention, for the law knows no distinction of plus et minus in its protection of property. I will place this last position in a practical point

of view, and elucidate the general argument, by a reference to established usages and rights.

The composition of a literary work, or of a musical piece, is altogether a matter of intellectual labour and skill. The transposition of the creative mind to paper, as a mean of exhibiting its powers of production, is a mere manual operation, which, whether performed with a greater or less degree of nicety and dexterity, will not affect the intrinsic value of the production; but antecedent to and during the whole of this operation, the entire right in the property existed in the author or composer; and from the moment of its exhibition, it becomes an actual property, claiming the full protection of the law, which holds all persons injuring the right amenable to its jurisdiction. Just in this manner does the *principle* of the law operate for the universal protection of intellectual labour exhibited in the production of every new discovery and improvement; but this clear principle is lost sight of by our statesmen and writers, when they speak of the *bargain* between the Crown and the inventor, for the *protection* of his invention; and the plain principles of justice are entirely subverted, by their placing the power of making the terms, and fixing the price of the pretended bargain altogether in the hands of the Crown, or its officers, and abducting the legal protection, if those terms and the price are too onerous to be complied with.

We will pursue the practical argument, in regard of authors and musical composers. They prepare their M. S. S. for publication; the setting of the press, and the engraving of the plates, are matters of manual dexterity, and technical attention; the manner of printing, and the getting up of the publication, are incidental circumstances, which will scarcely affect the value of a *new* work. The creative mind—the *intellectual labour*, will stamp its intrinsic merits, and regulate its sale. Now, in this instance, the principle of law, which knows nothing of plus et minus in the extent of its protection, and which makes no pre-judication of the value of that intel-

lectual labour to the community, is in full operation. All literary property is EQUALLY protected, when published according to the required forms, from a penny pamphlet to the most extended and expensive work; a just and equal security covers with its protecting ægis—the three-penny song and the majestic opera—the unpretending chaunt and the lengthened oratorio*.

I will illustrate the argument by a reference to painting, drawing, and the graphic arts. Painting and drawing require the union of a great degree of manual dexterity with the inventive talent, skill, and intellectual labour, which originate the design. The several branches of engraving, independent of original composition, are arts in which skill and practice, as contra-distinguished to the powers of the creative mind, form the claims to protection; yet still that species of skill, and the progressive experience which continued practice gives, are the operations of the mind, which, in their actual exhibition, constitute a new value of the materials operated upon, or with, in like manner as do the invention and creative skill developed in the composition of a picture or drawing.

Now, all these different modes of exhibiting intellectual labour, by an actual production of something which did not exist, are equally under the protection of the law, without reference to the greater or less value of the respective productions, or to the question of their being of any *intrinsic value* to the community. The surreptitious copiest, equally with the man who commits open piracy upon a picture, drawing, or plate, is amenable for the wrong committed; and the law gives compensation to the party injured, without exclusion to any, because the injury done is small. In cases of unwarranted copying, or piracy of a picture, drawing, engraving, literary or other composition, there is no theft or felonious appropriation of an actual substance, or of a tangible object. Upon what principle then does the law interfere?

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* Authors and copy-rights were first put under the protection of statute law, by 8 Anne, c. 19 (A.D. 1709.)

Upon this clear and incontrovertible principle—that there is an inherent actual property in intellectual labour—in the creation of the mind—in the inventive talent—independent of, and distinct from the organized matter or form in which that labour, creation, and invention may be exhibited; and that there is an indefeasible claim for protection to such property, independent of bargain or compact, saving the virtual compact of equal and universal security to all property, as the original price for the individual's submission to the laws and institutions of society; and, finally, that such equal and universal protection of the law covers the minutest as well as the most extensive property.

I am not contending for an abstract, unoperative, ineffective, or useless principle—for a principle inapplicable to the wants, or unimportant in the practical government of society.

The great broad principle of the inherent indefeasible claim of every individual, to a full, complete, and effectual protection to every portion of his labour and property, is an active, living, and acknowledged principle of our own institutions—a principle interwoven with *our* social policy—a main basis of support to *our* fabric—a principle put into daily operation in the actual administration of *our* affairs—a flaming, elevated beacon fixed for the guidance of *our* judges, and for the safety of *all*.

It may be asked what is the necessity of demonstrating so clear a position, as that every individual has an inherent, indefeasible claim upon society for the full and effectual protection of every portion of his labour and property? I answer—because this principle, clear as it is in itself, is entirely lost sight of by our legislators and others in its application to Patent laws,—*Patent no laws*,—Patent fees,—Patent charges,—and Patent practice, in respect of inventions and improvements.

The whole Patent System is a system of exclusion from any Protection of the greater Number of Inventions; it forms an irrational exception to the principle

of equal protection of all property acknowledged by our laws, and an anomalous contradiction to the indefeasible *noli me tangere* CLAIM, (if I may so term it,) of every individual to the benefits of his labour, skill, and industry.

These main and important bearings upon the subject of this system of pretension, fallacy, and absurdity, appear no more to have presented themselves to the apprehension of our parliamentary speakers upon the law and practice of Patents granted for inventions, than if they were about to regulate a Chancery Patent office in the moon, for the *protection* of the lunar schemes and enterprizes of A.D. 1825 and 1826 *. It is unfortunately equally the characteristic and the misfortune of a great portion of modern pseudo-legislation, that *principles do not form the basis of proceedings;*—*expediency*, a kind of chamelion animal, changes every object according to its own varying hues.

There appears, however, to be one species of *expediency* which, fixed like Ixion to his wheel, never changes its complexion, character, or situation—the revolving State-jenny spins on from year to year with the *expediency* of non-interference with the Great Seal, firmly fixed in its circumference; there it keeps its absolute place, spite of all the revolutions.

There appears a kind of Cochin-China awe pervading our most spirited senators, when approaching the mystic presence of this British Grand Lama; but to think of enquiring whether the revenues of his priests may be curtailed, consistently with the public good, would be heresy and treason united;—broiling eternally would be too slight a punishment for such atheistical Paul Prys. However that may chance as my lot, I feel an uncontrolable inclination to take a calm view of the dimensions and pretensions of his divinityship.

One senator in our chapel has " no intention of encroaching

* In the year 1825, 247 English Patents for inventions were sealed, being 120 beyond the average for the last five years. These *mental motions* produced about £. 12,000. additional income to the officers and *those concerned in doing these State nothings.*

on the prerogative;" another says, "the subject is full of difficulties, and should be approached with caution;" a third, who actually derives an income of about £.2000 per annum, from the "*mere motions of the thing*," finds it an unfortunate, erroneous, but *very general* opinion, that the *thing* may be made to work better with less oil; and a fourth, who was lately one of the priests of the temple, deriving an annual aid from the aforesaid "*mere motions*," to the amount of above £.3,000—with a kind of star-light gaze at a reinstatement to his *resigned* office—"cannot assent that any thing but the "*thing*" itself shall operate our protection, notwithstanding the unfortunate, erroneous, but very general misgivings as to the utility and expense of those operations. The best answer to this olio of backing, courtesy, awe, and pretension, was given in ten words by Mr. Maberly, who "Doubted very much whether the present law of Patents was productive of *any* public advantages; whether, in fact, it did not throw obstacles in the way of mechanical ingenuity." This is a point blank shot at the sanctum—a light thrown upon the *principle* of the system.

This leads me to a consideration of the manner in which the Patent laws, including the expenses, operate as obstacles in the way of inventive ingenuity generally.

First,—The Patent system is, in respect of its enormous fees and charges, a system of EXCLUSION from *any* protection of the greater number of inventions. I will look upon the United Kingdom of Great Britain and Ireland as an integral dominion; I am especially entitled to start from this point, as His Majesty's Ministers have repeatedly declared that the Emancipation Bill, now actually passed, virtually and essentially constituted the seperated nations—a single undivided community. As we are now a *consolidated Empire*, I will review the effect of the *consolidated charges* a man must pay *(if he can)* for the protection of his discovery throughout the King's *now* united dominion. If he cannot pay the *consolidated charges*, he

must be content to put up with so much of ***unconsolidated protection*** as he can afford to purchase.

The items in gross, not separating the respective shares of Messrs. my Lord Chancellors and Advocate, Attorney Generals, Solicitor Generals—of Messrs. Yellow, Green, Blue, or Red Wax—of the numerous families of the Recipis, and the Gratuities—the progeny of the great ugly Hanaper—and without estimating the hard-earned emoluments of our ambulatory, perpetual-motion Solicitor, who makes nearly fifty journeys to and from his office to the separate offices of the above named gentry for your service, stand thus—

	£.
* For your English Patent, alias *protection*, under the Great Seal of Great Britain, inclusive of duties, but without any of the extra fees commonly charged, are paid - - - - - - -	115
Average upon Mr. Attorney General's charge for hearing oppositions; on several Private Seals, journeys, &c. say - - - - - - -	10
English Patent - - - -	125
For your Scotch Patent (et ceteras unknown) about	95
For your Irish Patent (ditto - ditto) - about	130
Total paid for the *consolidated protection* throughout the *consolidated* Empire -	£.350

This sum is the general average of the amount of duties, charges, and fees for a set of Patents in one name, for any discovery that from its nature must be necessarily protected, as far as protection may be obtained under the present system, in the several parts of this United Kingdom. The charges for the colonies, and for more than one inventor's name, are not here estimated; nor the necessary expense of treble sets of drawings, and your solicitor's charges for his labour.

* The Keeper of the Great Seal is always to be the Lord High Chancellor, by stat. 28 Hen. III. The Keeper of the Scotch Seal is the Lord Advocate—Act of Union, 5 Anne, cap. 8, A. D. 1707. The Keeper of the Irish Seal is the Lord Chancellor of Ireland—Act of Union, Geo. III. A. D. 1800.

There are many discoveries connected with distillation, and improvements in chemical processes, which to be secured to the inventors must be covered by an entire set of Patents. If a man, therefore, cannot command a clear sum of £400, after all his expenditure in experiments and machinery for the completion of his discovery, ***however valuable it may really be***, he must be content to forego the results of his skill and labour, and the public the advantages of the improvement.

The Patent system therefore is, especially in the continuation of this absurd and onerous obligation, to take out three Patents for the self-same purpose in one united and ***consolidated*** empire—a system of intolerable ***exclusion***—of bitter mockery—of heartless exercise of the prerogative, and of the most cruel oppression. Above all, it militates against the first principle of the social compact—the claim of every individual to the universal protection of his property.

We have demonstrated that the law in this country acknowledges intellectual labour and inventive talent to be an inherent and ***actual*** property in the individual, and that it extends its universal protection to every portion of such property, without estimate of its relative or intrinsic value, for the purpose of ***exclusion*** from the principle. How does the Patent system of enormous duties, charges, and fees operate but as a denial of this sound and wholesome principle, and as a blighting exclusion from its benefits of the talent, ingenuity, and industry of all who cannot command the means of purchasing these expensive and insiduous securities?—securities prised and rated not only without law, but contrary to the anciently established land-marks of the law—land-marks defaced, obliterated, choked with rubbish, by the uncontroled operations of this nefarious system. Yet this system of evil and wrong is not to be touched—not even to be examined in some of its worst features—***its extortionate charges***.

I trust the public voice will insist upon this system being probed to the very foundation, in respect to its pretensions, charges and fees; and that the inquiry shall not be limited to

one principal evil—the absence of rational laws of adjudication, and of security to inventors. I acknowledge the great importance of this part of the investigation; but what will be its effective results, compared with what they ought to be, upon the broad principles of universal protection to property—of individual claim to that protection—of the *right* of the subject to the removal of absurdities, restrictions, and exclusions, which wither his industrious attempts, and blast his intellectual exertions?

If the labours of the Committee upon the laws and practice of Patents should leave inventions, of which from their nature ought to be protected throughout the United Empire, to the rapacious gripe of three Patents for a protection, however well defined and secure—if their enquiries stop short of an earnest effective examination of the origin and nature of the attendant extravagant, and numerous fees and official charges and their successive additions, *and of the authority by which those additions have been from time to time made*—if they fear boldly to grapple with this important part of the subject with a direct view to the removal of these oppressions—if they mean to countenance the continuation of the several heavy Government stamp duties upon Patents and connected documents, amounting to a tax of about £.40. upon each individual Patent for each kingdom—if, finally, the Committee will confine the *principle* of their exertions to the security of those inventors only who can raise £. 400. for the charges of three Patents for one invention, or at least of £.150. for the price of a limited *inefficacious* single Patent, they will shut out, with blind policy, from the exercise of their talent and industry, the numerous classes of inventors who cannot raise those large sums; they will continue the unjust and arbitrary exclusion of tens of thousands of valuable improvements from the wholesome benefits of that universal principle of law which equally protects every species of property; and they will further weaken that fundamental compact of society under which every man claims *of inherent right*, as the return for his acqui-

escence in its general institutions—the extension of that principle of universal protection to HIS intellectual exertions, and property in his labour.

It would not be difficult to find a mode of fully and cheaply securing every man's property in his inventions, as literary copy-right property *is* secured, without any reference to its value. What may be the eventual value and importance to a manufacturing country of apparently the most insignificant discovery, no one can predict—no scientific and rational man would venture to predict. Had a ready, effectual, and unexpensive system of protection, to every invention, been in action a century and a-half since, the discovery of the elastic power of steam, and its application to mechanical purposes, instead of remaining for one hundred years *a mere literary notice, deemed of no practical value,* would have become, in all probability, the powerful instrument, in the hands of an earlier genius than Watt, for the raising of his country's fame and commerce. An Arkwright—a Wedgewood—a Peel—might have given the manufactures of the seventeenth century the pre-eminence of the nineteenth; and the prosperity of Great Britain might have made progressive advances, equally beyond the reach of calculation, and the attempts of rival nations to undermine it.

An extended, universal protection to *every* exertion of British talent and creative industry, may still secure incalculable advantages to our manufacturing and commercial enterprise; but the efforts of enlightened statesmen can alone free that talent and industry from the depressing trammels of antiquated pretensions, and exorbitant fees and charges, which are equally contrary to common sense, and *to the rights of individual members of the community.*

I remain, Gentlemen,

Your most obedient servant,

VINDICATOR.

Art. VII.—On the recent Patent Cause, Lewis v. Davis, and the Patent Rights of the Plaintiff.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—Mr. Dutton, of Wootton-under-Edge, having addressed you in reply to my observations on the recent trial, Lewis v. Davis, published in the Journal of Arts for February, I beg to request the favour of you to insert the following explanatory remarks in your next number.

It is far from my wish to enter into controversy on the points at issue, but the view I had previously taken of the subject, appears, on reflection, to be as correct in principle, as the details of facts are uncontrovertible. My object was to give correctly the particulars of the case, agreeable to the impression made on my mind by the dictum of the learned Judge and the arguments of counsel; and to state the conclusion to which so important a decision would naturally lead; and I am supported by the opinion of gentlemen of science, that such decision was, in its effects, at variance with the general principles laid down in other cases of a similar description. I considered it of importance to patentees and manufacturers, that the grounds of that decision shall be clearly stated, and the rights and claims of the plaintiffs placed on their proper basis, viz. the exclusive right to shear "from list to list by a rotatory cutter," and that without any special right or claim to the invention of the machinery by which such shearing was to be performed.

Mr. D. commences his remarks by a metaphysical observation of doubtful authority, viz. "that it is to association that we are indebted for all our new ideas;" and he applied this abstract principle to the case of the steam engine, as improved by Watt, in illustration of the same principle when applied to Lewis's machine. It has been frequently observed, and often happens, "that few things are more dissimilar than a similie,"

and such is the case before us, for if Bolton and Watt had claimed "the *cylinder and piston*," or the formation of the "vacuum in an iron cylinder," as stated by Mr. D., their patent would have been of little value, instead of being as it in reality was, the most valuable and lucrative Patent on the roll. Mr. Watt's claim was placed on much higher and safer grounds; it was for the application of steam as an elastic force, under an improved construction of the usual machinery; steam having heretofore been used as a means of obtaining a vacuum only. Here was the new and novel application of a principle of power, and the parts of the engine that had been in use before were not claimed as part of that invention, but the particulars of this case have little bearing on the case of Lewis's Patent. Machinery has been so extensively adopted, and variously applied to the manufacturers of the country, that it is scarcely possible to originate a new machine, and Patents have for a great length of time been generally taken for *improvements* only, because such parts of a machine that had been previously known and used, was considered as public property, and to make such parts the subject of an exclusive claim, has been held fatal to the Patent, in the specification of which such claim has been set up.

In the case of Bovil *v.* Moore, Chief Justice Gibbs observes, "if Mr. Brown has invented only an improvement of the old engine or machine, which existed before, then the specification by which he claims the whole (machine) to himself, must be bad." Thus one of the most valuable improvements in that singularly ingenious machine, called the lace machine, was entirely lost to the Patentee, though the improvement was highly important and beneficial in lace making, and produced an article of very superior texture.

Had Mr. D. sufficiently attended to the statute of 21 James I. and to those general principles which have been amplified and applied to the decisions of our courts of law, he would have perceived that most valuable inventions have been wrecked on this ground, and that any general claims to

parts of machines that had been invented or used by others, cannot be sustained in a court of law, and if the described method of Lewis combines in friendly " association," the inventions of Harmer, Dyer, and others, they may possibly have a most unfriendly effect on the security of his Patent, should it ever happen to be again called in question in a court of justice, which is I believe expected.

The observation of Mr. D. on the invention of the inherent principle of cutting by a rotatory cutter, which he terms " continuous cutting," can be scarcely esteemed to be correct—for a rotatory cutter having been before used by Price and Collier, and their method of operation was by a rotative motion, or continuous cutting,—in opposition to the vibrating *action* of the shear and reciprocating cutter in common use, and what can there be that is new and novel in the direction of cutting? Shearing across the cloth is the old and approved method; may we not ask then what remains? Why truly the abstract junction of the rotatory cutter with cutting cloth transversally. Both old in their seperate invention and application—and only new in their joint application—and to enable the rotatory cutter to perform the operation of cutting when they are thus joined together, all the machinery employed had been previously in use for cutting across the cloth from list to list.

In the year 1811, Mr. James Mallory (an American), obtained Letters patent for an improved machine for cropping peltry, and shearing woollen cloth. The Patent right of this machine was sold to the Messrs. Norman, of Martin's Lane, Cannon Street, London; and a machine on one of Mallory's plans was constructed by Messrs. Donkin and Co. eminent engineers, for the purpose of shearing woollen cloth. This machine was sent to Mr. Gardner, of Chalford, for trial, and not answering the expectation of the parties, the late Mr. Price, of Stroud, was recommended to make such alterations and improvements as the machine might require; and under an arrangement with Mr. Norman, this machine was finally transferred to the premises of Messrs. Lewis, of Branscombe. In

his specification Mallory suggests two modes of applying a vibrating cutter, and one for a rotatory cutter or revolving cylinder. This machine, in connection with the specification of particulars, appears to have laid the foundation for the subsequent improvements of Price and Lewis, if not also those of Collier; and Mr. Price appears to have availed himself of Mallory's suggestion of the revolving cylinder operating against a ledger blade, in the construction of his cutters. How far Mallory was really the inventor of the rotatory cutter appears doubtful; but it is a fact, that nearly about the same time, Price and Lewis in England, and Collier in France, turned their attention to shearing by a rotatory cylinder, operating by a continuous movement, and this sufficiently accounts for, and explains why neither Price, Lewis, or Collier, claim the exclusive use of the rotatory cutter in the Patents of 1815, each claiming their own particular method of construction, both in cutters and machinery.

Mr. Collier's machine was approved by the French manufacturers, and one or two was put to work by Mr. Hirst, of Leeds; but the cutting was not approved in England. The plaintiffs, in conjunction with Mr. W. Davis (now of Leeds,) their engineer, obtained another Patent in 1818, on which the action in question was brought, but the specification of the Patent proceeds upon the same view of the subject as the former one, and is taken for the several improvements specified, and sets up no general claim, either for the rotatory cutter or its method of acting, but for the described method of shearing from list to list. Gardner and Herbert followed, and their machine appears to be a considerable improvement upon that of Lewis's; the rotatory operation of the cutter, combined with a lateral movement, is held to effect most beneficial results, producing on the cloth a more soft, smooth, and beautiful face, than can be effected by any other machine, such being the opinion of several clothiers of the first practical experience and respectability in the trade.

Mr. W. Davis, of Leeds, has had two Patents for machines to shear transversally, or from list to list, since the year 1818; and this, at least, is a tacit proof that he had not contemplated that his late partners and himself had secured the sole right of shearing from list to list by a rotatory cutter, by every shape and form of construction under which such machinery could be manufactured.

In respect to the infringement, it would be mere affectation on the part of the defendant, to pretend he did not shear from list to list by a rotatory cutter, and equally at variance with fact, to assert that he used any of the plaintiffs' inventions in so doing. The ruling of the court must then apply solely to the general claim, which is a Patent for application of method, and not for a new combination of organized machinery.

Mr. Dutton charges me with frittering away a valuable invention. I can only reply, that I had no such purpose in view; or in any respect to depreciate the value of Mr. Lewis's machine; my object was solely to strip the subject of all the extraneous matter in which it appeared involved, and to shew the real ground on which the decision of the court proceeded; and if such a claim can be made the subject of a Patent, the public ought to be in possession of the fact. I cannot, however, concur in the view Mr. D. has taken of the beneficial consequences resulting from this ruling of the learned Judge, for it appears to operate injuriously by prohibiting, for the period of the Patent, all improvements for shearing cloth by a rotatory movement. It is high time, however, that the laws on this subject should assume a definite character, and that the ingenuity of the country should not be subject to expensive law suits, and valuable inventions dependant for protection on the ruling of the court, or the uncertain impressions of a jury.

I am, Gentlemen,

Your most obedient servant,

J RAYNER.

London, April 8, 1829.

N. B. Since writing the above, I have read with much satisfaction, Mr. Lennard's able and judicious observations on the Patent laws, and considering the support his views received from Mr. Peel, and other influential members of the House of Commons, I see just ground to hope that this important subject will have that attention which it so justly deserves; and I hope your correspondent, Vindicator, will avail himself of this opportunity to enlighten the Committee with the details of his plan, the object of so much study and application. Mr. De Jongh should also favour the Committee with his views, that the scattered fragments may be collected into the focus of a report from the Committee, that the opinion of scientific men may be embodied in an improved code of laws, for the better protection and security of valuable inventions and improvements.

Art. VIII.—On the Figure of the Earth.

Captain Forman has addressed a long letter to us, on what he considers to be an error in the mode which mathematicians have adopted to ascertain the figure of the earth. Many of the remarks contained in this communication are of a character not suited to the pages of a public journal; but as the subject is one of very great importance, taken in a scientific point of view, and on which considerable difficulty has been felt by those who are unacquainted with the higher branches of mathematics, we think it desirable to step a little out of our usual course, and to attempt to render the problem simple and evident.

The writer observes, "About the time that Sir Isaac Newton produced his famous hypothesis on the earth's figure, philosophers were very anxious to obtain the lengths of two degrees of latitude in distant parts of the earth, in order to ascertain, in the first place, whether the earth is really an oblate spheroid, as Newton supposed; and, secondly, if it

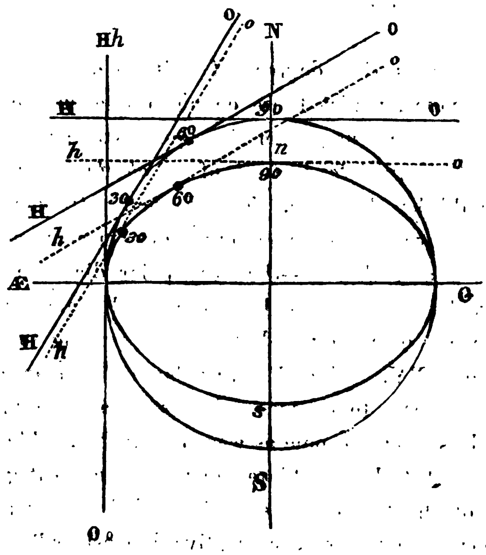
were so, in what proportion the length of the equatorial diameter exceeds the length of the polar diameter. As the question excited a good deal of interest at the time, Lewis the Fourteenth, to oblige them, dispatched two companies of philosophers to measure the length of two degrees—one at the equator, and the other under the arctic circle; and as it was found (supposing the admeasurements to be correct), that a degeee near the *pole was considerably* LONGER than a degree *at the equator*, it was admitted by all that the earth is an oblate spheroid."

The writer then enters into an argument, shewing that from these data the very reverse conclusion ought to have been deduced, which in fact is a notion very commonly taken up by those who are not deeply versed in the science, for it very naturally suggests itself to the inquirer, that the actual distance between the two points cut by a given angle on the periphery of a circle, must be greater as the diameter of that circle is increased; and consequently, that a degree upon the earth's surface should be longer at that part (the equator), where the periphery is farther from the centre than at the poles, which is contrary to the fact.

Without entering into an investigation of the effects resulting from centrifugal force, as the earth revolves upon its axis, exhibited by the pendulum, which probably led to the very natural conclusion, that the earth must be an oblate spheroid—that is flattened towards the poles, or as it is familiarly described, like an orange, we shall endeavour to shew, by a diagram, that the circumstance of a degree of latitude being *longer* near the pole than at the equator, demonstrates the fact; and leave the examination of the quantity of difference between the two diameters to those who may feel disposed to follow the laborious calculations of those philosophers who have informed us that the earth is above thirty-five miles larger in its equatorial than in its polar diameter.

Perhaps we cannot do better than take the illustration of

this problem as given by Mr. Stephen Lee, late librarian to the Royal Society, which refering to the diagram, is expressed nearly in these words:—" Were the earth one continued plane, it is evident no change of horizon could happen from mere change of place of a spectator on the earth's surface.



The circle in the diagram represents the section of a *spherical*, and the ellipse the section of a *spheroidal* globe; they are, as may be perceived, concentric.

Capital letters are used for the former, and corresponding small letters for the latter.

N, *n*, are the North, and S, *s*, the South poles; H, O, and *h*, *o*, the several horizons of a spectator at the equator, and at 30°, 60°, and 90° of latitude.

Æ, Q, represents the direction of the equator; and N, S, the direction of the earth's axis extended into infinite space.

The horizon of a spectator must be a tangent to that point of the curvilinear surface on which he stands, and this will always be the case for every curvature.

Therefore drawing tangents H, O, touching the circle at 0°, 30°, 60° and 90° of latitude, and lines parallel to these touching the spheroid, as *h*, *o*, it will be plainly seen that whilst the former H, O, touch at equal distances, the latter do not, the 0° and 30° on the spheroid being less distant from one another than the 30° and 60°, and these less distant than the 60° and 90°.

Hence it appears that degrees of latitude on a sphere are every where equal, whilst those on an oblate spheroid continually increase in passing from the equator to the pole; but were the earth a *prolate*, instead of an *oblate* spheroid, the contrary would be the case. The French astronomers did attempt to prove—from some erroneous measurements of M. M. Ricard and Cassini—that the polar diameter of the earth was really greater than here quatorial diameter. The fact was warmly disputed; and it was for settling the difference that Louis XV. "(not XIV. as Captain Forman says)," sent out astronomers to measure a degree of latitude under the equator, and as near the pole as was practicable. The result proved the earth to be an oblate spheroid, though it gave the proportions of the two diameters a little different from Newton's previous estimation of comparative dimensions."

Recent Patents.

To Zechariah Riley, *of Union Street, Southwark, in the county of Surrey, Engineer, for his having invented or discovered certain improved Apparatus to be attached to Carriages, for the purpose of affording Safety in Travelling.*—[Sealed 10th Dec. 1828.]

This invention, which consists of certain apparatus to be attached to a travelling carriage, has two objects; the first of which is a mode of disengaging the horses from the carriage, in the event of their taking fright and running away; the second is a mode of locking one or both of the hind wheels, in order to impede the movements of the carriage, and prevent it running into any dangerous situation, as down a declivity, so as to overturn the carriage after the horses are disengaged.

SPECIFICATION.

My improved apparatus to be attached to carriages, for the purpose of affording safety in travelling, has two particular objects; first, to afford the means of liberating the horses from a carriage instantly, in the event of their running away; and, secondly, in a contrivance for locking one or both of the hind wheels, in order to prevent the carriage from running forward, by its momentum, when the horses have been released from it. Fig. 1, of the accompanying drawing (Plate III), is a side view of the carriage, with the improved apparatus adapted thereto, (the body being removed, in order to exhibit the new parts more evidently.) Fig. 2, is a horizontal view of the carriage, shewing the improvements as seen on the upper side. Fig. 3, is a front view of the splinter bar,

exhibiting the manner in which the traces are attached and detached. Fig. 4, is a view of the back part of the carriage, shewing the hind wheels with their axletree, and the apparatus connected thereto for locking the wheel: the respective letters of reference pointing out the same parts of the apparatus in all the figures.

The splinter bar *a*, *a*, is fixed to the carriage by means of the iron strap pieces *b*, *b*, as seen in figs. 1 and 3. The pins *c*, *c*, *c*, *c*, round which the traces are intended to pass, are attached to an iron frame *d*, *d*, and this frame is mounted upon or connected by joints to two levers *e*, *e*, by which means the iron frame, with the pins *c*, may be raised or lowered, the pins passing through the splinter bar.

On raising the frame, the ends of the pins enter sockets, in the upper iron bar *f*, *f*, *f*, *f*, for the purpose of holding the traces; and when the frame is lowered, the pins descend with it and release the traces.

The shifting of the frame and pins is effected by the lever *g*, which has its fulcrum in the middle of the splinter bar. The shorter arm of this lever is connected to the rods *h*, *h*, which are attached by joints to the levers *e*, *e*, as shewn in fig. 1.

When the traces are to be connected to the carriage, the loops at their ends are to be passed over the pins *c*, between the splinter bar *a*, and the upper bar *f*, and the longer arm of the lever *g*, being brought down, and locked, by means of the spring catch *i*, to *k*, the poll of the carriage, the pins will be passed upwards through the loops of the traces in the way above described, and will be held fast by the locking of the lever.

At the extremity of the lever *g*, there is a small lever *l*, turning upon a fulcrum pin, which lever lays along the poll of the carriage when the apparatus is locked; and when it is required to release the traces from the

carriage, a cord attached to the end of the lever *l*, being pulled, draws up the lever *l*, and this movement of the lever causes a small excentric *m*, to act against the spring catch *i*, and force it back, releasing the lever *g*, which rising allows the frame *d*, and the pin *c*, to descend, and let go the traces, as above explained.

The throat straps, which pass from the horses' collars to the end of the pole, are to be made fast to the rings of the piece *n*; and this piece *n*, is confined in a slot between the jaws of the clip *o*, when the before described apparatus is locked, but on the lever *g*, rising, a bent arm *p*, extending from the lever *g*, pushes the long rod *q*, which rod passing through the whole length of the pole, projects the clip piece *o*, forward, and that being no longer confined, its jaws open, and allow the piece *n*, with the rings and throat straps, to be drawn out by the horses, which are thus completely disengaged from the carriage.

When four horses are to be attached to the carriage, the leaders are connected by their bars, in the usual way, to the ring at the end of the clip *o*, the opening of which by the means above described disengages them.

In order to prevent the fore wheels of the carriage locking under, when the horses are disengaged from it, a pin *r*, at the back of each of the levers *e*, rises, as the frame *d*, descends, and passing through the futchels *s*, enters into notches in the wheel plate *t*, and thereby fixes the fore carriage.

The apparatus for locking the hind wheel of a carriage is shewn in figs. 1, 2, and 4, and consists of a break or friction band *u*, embracing the naye of the wheel; and also of a tumbler catch *v*, to be thrown into a groove in the nave of the wheel, by the action of a lever *w*. The lever *w*, turns upon a fulcrum on the piece *x*, fixed to the axletree; and the extremities of the longer arm of this

lever works between two plates *y*, containing the catches and the springs, which keeps the end of the lever stationary, whether the wheel is locked or unlocked.

In fig. 2, the parts are represented in the positions in which they would stand when the wheel is unlocked, and in fig. 1, they are placed as when the wheel is locked. On pulling the cord 1, which is fastened to the connecting piece 2, between the levers 3 and 4, the lever 3, disengages the spring catch 5, from the tooth 6, on the end of the lever *w*; and allows the lever to be drawn into the position shewn by dots, when the spring catch 7, holding the tooth on the end of the lever, keeps it in that position, and the weeel locked.

The locking of the wheel is effected by the shorter arm of the lever *w*, which works in the slot in the piece 8, see fig. 1; and as it moves sidewise, throws up the tumbler catch *v*, into the groove 9, ready to lock against the notch at the end of the groove; at the same time the piece 8, being moved, brings the friction band *n*, (which is attached to it,) into close contact with the periphery of the nave, and thus retards the rotation of the wheel, until the notch at the end of the groove comes in contact with the catch of the tumbler, when the wheel is effectually stopped.

For the purpose of unlocking the wheel, the cord 10, which is passed over a pulley attached to the underside of the carriage, must be drawn, which disengages the spring catch 7, from the tooth 6, and allows the lever *w*, to be brought into its former position, and the tooth of the tumbler thrown down; and as the wheel always locks at the same point, I have placed upon the tire a thick piece of steel, for the purpose of saving the wear of the tire.

It is only necessary to add, that the cords for raising the levers in disengaging the horses, and those for locking

and unlocking the wheels, may be conducted by pullies to any part of the carriage, so that they may be acted upon by either the coachman or by any persons riding within or upon the coach.

[*Inrolled in the Rolls Chapel Office, April,* 1829.]

Specification drawn by Mr. Newton.

To Samuel Lawson *and* Mark Walker, *of Leeds, in the county of York, Machine Makers and Flax Spinners, for having invented Improvements in Machinery for preparing and dressing Hemp, Flax, Silk, and other fibrous substances.*—[Sealed 9th October, 1828.]

The improvements herein proposed consist in a peculiar construction of a heckling machine, but principally in a novel mode of conducting a series of traversing heckles, for the purpose of combing the fibres of flax, hemp, and and other vegetable materials, after they have been broken or bruised and scutched: that is the woody part removed from the fibrous.

SPECIFICATION.

Our improvements in machinery for preparing and dressing hemp, flax, silk, and other fibrous substances, apply to that description of machinery which is employed for heckling or combing and separating the fibres of hemp, flax, and other fibrous materials, after the boom or woody part has been broken off by the ordinary processes employed for that purpose.

The first object of these improvements is to cause the points of the heckles to strike directly into the fibres of the material, and to pass along them in a straight line, instead of moving in a circular course, as is the case in most heckling machines heretofore employed, and which

consequently merely scratch the under side of the strick of hemp or flax, without effectually combing it; whereas, by this improvement, the heckles introduce themselves between the fibres, and comb the flax more perfectly. Secondly, in a contrivance, by which the loose tow collected on the heckles is drawn off their points, and carried through a series of carding cylinders, and ultimately delivered between a pair of doffer rollers, in the form of a sheet or ribbons of sliver ready for the further carding or roving process.

In the accompanying drawings (see Plate IV, fig. 1.), is an external view of the side of the machine. Fig. 2, is a view of the opposite side. Fig. 3, is a horizontal representation of the top of the machine; and fig. 4, is a vertical section, taken through the middle: similar letters referring to corresponding parts of the machine in all the figures;—*a, a, a,* is the frame or standard upon which the machinery is mounted, made of cast iron or other fit material; *b, b,* are two circular side plates, having a D formed groove *c, c, c*; affixed to each: one of which is seen in the section, fig. 4; *d, d, d, d,* are two wheels, one on each side, with perforations or slots, *e, e, e, e,* made through them, as shewn in fig. 4; *f,* is the main axle of the machine, to which the wheels *d,* are affixed; *g, g, g,* are a series (twenty or any other number) of bars called fallers, carrying the heckle points. One of these bars, with its heckles, is shewn detached from the machine at fig. 5. The heckle bars swing upon pivots or pins *z, z,* extending from arms at the ends, and when they are mounted in the machine, these pins pass through the slots *e, e, e,* in the wheels *d, d,* and are supported in the groove *c,* on each side of the machine.

Rotatory motion being given to the wheels *d,* and in the direction of the arrows, the heckle bars are carried

forward along the groove *c*, by means of the side of each slot bearing against the pins or pivots *z*, as the wheel revolves. The heckle bars swinging upon the pivots, preserve their pependicular positions in every part of their course, and by the peculiar form of the groove *c*, are made to rise perpendicularly, and strike their points directly into the fibres of the flax or hemp, and then traversing along the flat upper part of the groove in a straight line, comb or heckle the fibres, and carry away the loose tow which is taken from the points of the heckles as they descend, by the carding cylinder *h*. This traversing of the heckles will be clearly understood by reference to fig. 4, remembering that the D, formed grooves *c*, are stationary; and the perforated wheels *d*, constantly revolving.

In figs. 1 and 3, are represented *i*, of a fast pulley, and *j*, a loose one, mounted upon a short axle *k*; to which rotatory motion is given by a band from an engine or any first mover. On the short axle *k*, there is a pinion taking into the toothed wheel *l*, on the main axle, (see figs. 1 and 3,) by means of which connection, the main axle with the wheels *d*, and the heckles *g*, *g*, are driven.

As it will be desirable that the operation of heckling the strick of flax should commence near the end of the fibres, the holder *m*, in which one end of the strick is confined, is placed in a lever *n*, mounted upon a shaft or axle *o*, (see figs. 3 and 4), and this lever is made progressively to rise and fall by means of other levers, or an arm and rod, and a rotatory cam, seen best in fig. 2.

In commencing the operation of heckling, the strick of flax is raised up, as shewn in the figure, so that the fibres are only at first acted upon by the heckles, near the extremity of the strick; but the lever which holds the strick being

gradually lowered, ultimately allows the whole length of the strick to be submitted to the operation of the heckle points, which then comb the fibres completely through, from the holder to the extremity of the strick; after which the strick is removed, and replaced by another, to be operated upon in that same way.

Fig. 2, shews the mode by which the holder and its lever is made to vibrate. Upon the outer extremity of the main axle, on that side shewn in fig. 2, there is affixed a pinion *p*, taking with a toothed wheel *q*, which revolves upon a short axle, set in the side of the frame; and to this last mentioned wheel there is attached a cam or excentric *r*. To the end of the shaft *o*, on which the holder lever is mounted, an arm *s*, is attached, and the reverse end of this arm is connected by a joint to the adjustable rod *t*, *t*, in which there is a slot, sliding upon the axle of the arm *r*; and at the extremity of the rod there is a small roller *u*, working against the periphery of the cam.

It will now be seen, that when the roller *u*, is acted upon by the larger diameter of the cam, the rod *t*, and arm *s*, will be drawn forward, so as to elevate the holder lever; but when the smaller diameter of the cam is acting against the roller *u*, then the rod *t*, and arm *s*, will be allowed to recede, as shewn by dots, and the holder lever, with the strick of flax, will be lowered, so that the points of the heckles may be introduced into and pass between its fibres, from the holder to the end.

In this machine there is provision for heckling four stricks of flax or hemp at one time (see fig. 3), and the heckles employed are to be of different degrees of fineness, to suit different qualities of material; and when the strick has been acted upon by the coarser heckles, it is

intended that it shall be removed to the next holder lever, to be acted upon by finer heckles, and so on, as may be found desirable.

It has been shewn in what manner the tow is collected upon the carding cylinder *h*, it remains now to describe the operation of carding it, and delivering the tow after it has been so carded, in the form of a sliver. The cylinder *h*, is made to revolve, by means of an endless band from the large rigger *w*, which is carried round the small rigger *v*, fixed on the axle of the cylinder *h*; and also from this rigger another endless band passes round the small riggers *x*, *x*, upon the axles of two of the lesser carding cylinders. At the reverse end of the axle of the principal carding cylinder *h*, there is a pinion *y*, taking into a toothed wheel *A*. (see fig. 2), upon the axle of the last carding cylinder *B*, called the doffer cylinder; hence by the rotation of the cylinder *h*, as above described, the doffer cylinder is driven round, and a band from a rigger affixed to the axle of the last mentioned, drives the upper carding cylinder.

The tow thus collected from the heckles, and prepared in the carding engine, is taken from the doffer cylinder in a sliver or ribbon, between the two doffer rollers *C*, at the back of the engine, which rollers are made to revolve by means of a toothed wheel *D*, attached to the axle of the doffer cylinder, and two wipers *E*, *E*, are placed in contact with the doffer rollers, to prevent the sliver adhering to their peripheries.

It will be seen by reference to fig. 3, that the cards are placed upon the cylinders in four rings, answering to the four holders, consequently there will be four ribbons of sliver discharged, which may be collected in cans, and conveyed away to the roving machine.

Having described the various parts of our improved machine for heckling flax, hemp, and other fibrous materials, we think it necessary to observe that we claim, in the first instance, the general construction of such machine, and its application to such purposes; and, secondly, the mode of mounting the traversing heckles on bars, with pivots at their ends, which we denominate fallers; and the adaptation of the perforated wheels and the D, formed grooves, for the pivots of the bars to traverse along; by which contrivance the heckles are kept always in perpendicular positions, and as they rise, strike into the flax direct, and close to the holder; and, lastly, the adaptation of such fallers carrying heckles, moved in the way described, to other machines employed in the preparation of flax, hemp, and other fibrous substances.

[*Inrolled in the Rolls Chapel Office, April,* 1829.]

Specification drawn by Mr. Newton.

To John Gottlieb Ulrich, *of Cornhill, in the city of London, Chronometer Maker, for Improvements in Chronometers.*—[Sealed 19th April, 1828.]

The subject of the present Patent is a further improvement in the mechanism of a chronometer, constructed on a novel principle, for the invention of which a Patent was granted to Mr. Ulrich in 1825. The design of that arrangement of the mechanism was to enable the mainspring to communicate its impelling power to the balance, without the intervention of a train of wheels and pinions, thereby avoiding the innumerable inaccuracies to which such trains subject the going of the time piece; a particular description of which invention is given in Vol. XIII, of the First Series of our Journal, page 122. The objects

and construction of the present improvements are described, as follow:—

SPECIFICATION.

My present improvements in chronometers are designed, in the first place, to reduce the labour of the balance; secondly, to govern the action of the escape wheel; thirdly, to lock the train detant; fourthly, to discharge the train detant; and, fifthly, to construct a compensating balance upon a superior plan to those which have been heretofore made; which improvements are to be considered as variations of the principles set forth in the specification of my former Patent, dated 25th March, 1825, for an improved remontier detached escapement (to which specification I refer); and also additions to the same.

The mode by which I reduce the labour of the balance is by diminishing the strength of the impulse detant, and applying an auxiliary spring lever, for the purpose of giving stability to the detant, at the time that the impulse spring lever is locking. The action of the escape wheel is governed by a bar or balance attached to the axis of the alternating pallets. This bar carries two adjustable weights near its extremities, which being placed nearer to or further from the centre, causes it to oscillate faster or slower.

To lock the train detant a spring guard is attached to the escapement plate, which is kept by the impulse spring lever when locked behind it, and by that means the train detant is prevented from being thrown out of the teeth of the escape wheel; but when the impulse spring lever is unlocked, the said spring guard is released, and the train detant set at liberty. To discharge the train detant a bent lever is attached to the alternating pallet piece, at one end of which lever a pin is fixed, and

the impulse spring lever striking against the pin, causes an arm, extending from the lever, to remove the train detant from the teeth of the escape wheel.

Before describing the novel construction of my improved compensation balance, I shall explain the details appertaining to the four first heads of my invention, as above stated, and exhibit the forms, positions, and actions of the several parts.

Fig. 1, of the accompanying drawings (Plate V.), shews the escapement in a quiescent state; *a*, is the balance axle, which being moved round in the direction of the arrow, the small discharging pallet *b*, upon that axle, will be enabled to escape freely past the spring *c*, without disturbing any of the mechanism; but on the return of the balance (that is its movement the reverse way to that of the arrow), the pallet *b*, comes in contact with the end of the spring *c*, which is in that direction stopped against a small projecting arm, extending from the impulse detant *d*; consequently the impetus of the balance causes the pallet *b*, to carry the impulse detant *d*, back with it, and by that means to withdraw the pallet *e*, at the end of the impulse detant from the point of the impulse spring lever *f*; which positions of these parts are shewn by dots in this figure.

The impulse pallet *g*, affixed to the axle of the balance, is at this moment in a situation to receive impulse; and the impulse spring lever *f*, being now at liberty, its elevated part *z*, comes in contact with the impulse pallet *g*, as seen in fig. 2, and drives it and the balance round.

The train detant guard *h*, which in fig. 1, is seen standing nearly at right angles to the train detant *i*, and thereby locking it, is by the advance of the impulse spring lever *f*, allowed to fall against the banking pin *j*, and by that means to unlock the train detant, as seen in fig. 2. The

impulse spring lever *f*, continuing its action on the pallet *g*, pushes it and the balance forward, into the position shewn by dots, and then escapes from it, as represented in fig. 3; when, by the impulse spring lever *f*, striking against a pin *x*, set in the end of the bent lever *k*, that lever is moved from the situation shewn by dots, in fig. 2, to that shewn in fig. 3.

An arm *l*, fixed at the back of the bent lever *k*, (called the discharging arm), is by the last-mentioned movement of the bent lever pressed against a pallet *m*, on an arm extending from the train detant, which is by that means made to recede; and the pallet *y*, on the train detant is drawn from the tooth *l*, of the escape wheel *n*, as shewn in fig. 3; thereby setting the escape wheel at liberty, which instantly moves forward in the direction of the arrow, allowing the point of the auxiliary spring lever *o*, to drop behind the tooth and the pin *p*, at the extremity of its arm, to come against the back of the impulse detant *d*, and thereby to hold it firmly; the tooth 7, of the escape wheel *n*, now pressing against the face of the alternating pallet *g*, as seen by dots, in fig. 3, forces the pallet piece into the position shewn in fig. 4, carrying its adjusting bar *r*, *r*, into the oblique situation there seen, which movement has caused the arm *s*, affixed to the pallet piece, to carry back the impulse spring lever into the position shewn in fig. 1, its point being now again held by the pallet *e*, at the end of the impulse detant.

On the tooth 7, quitting the face of the alternating pallet *q*, as in fig. 4, the tooth 9, comes in contact with the face of the other alternating pallet *t*, as seen in the dotted position, the force of which brings back the pallet piece, with the adjusting bar and the arm *s*, to a state of rest in the situation shewn in the 1st figure, which places the impulse spring lever, now held by the pallet *e*, in a state of ten-

sion, ready to give the succeeding impulse to the balance, in the manner before described.

The further progress of the escape wheel causes the tooth 15, to raise the point of the auxiliary spring lever *o*, and thereby to remove the pin *p*, from holding the impulse detant. The tooth 15, now coming against the pallet *y*, at the end of the train detant, the escape wheel is stopped; and in order to lock it, and prevent tripping by any tremulous motion in the train detant, the guard *h*, which has been brought back to its first situation, by the impulse spring lever, stands immediately behind the train detant, and confines it. There are two banking pins, *v*, *v*, placed so as to receive the recoiling stroke of the adjusting bar, and bring it to rest.

The ordinary construction of balances, applied to chronometers made of brass and steel, are liable to much interruption and irregularity of action, from magnetic influence and from the efforts of the two metals to separate from each other by their unequal expansions and contractions, at every variation of temperature. My improved balance is free from the former of these inconveniences, not having a particle of iron or steel about it, and is so constructed that the variable expansions and contractions of its parts effect the compensation required.

Fig. 5, is a horizontal representation of the balance; *a*, *a*, is a bar of platina, to which are attached by screws the end pieces *b*, and *c*; to the end piece *b*, one extremity of the lateral brass tube *d*, is affixed, and to the other end piece *c*, one extremity of a similar lateral brass tube *e*, is also affixed From the end pieces *b*, and *c*,; the stems *f*, *f*, rise, as shewn; and to these stems *f*, *f*, are respectively connected the segments or arms *g*, *g*, carrying the weights *h*, *h*, of the balance.

When an increase of temperature causes the metal of

which the balance is constructed to expand, that expansion will be greater in the lateral brass tubes *d*, and *e*, than in the platina bar *a*; the effects of which will be to bring the extremities of the segments nearer toward the centre of oscillation, and consequently to increase the velocity of the balance, although the parts are expanded, which expansion would otherwise retard its velocity. The segments or arms *g*, *g*, must be considered as levers, the fulcrums of which are at *f*, *f*; and these, as well as the extremities of the tubes *d*, and *e*, affixed to the end pieces *b*, and *c*, may be considered as comparatively stationary.

It will now be perceived that as the materials of which the balance is constructed expands, the lateral brass tubes *d*, and *e*, elongate more than the platina bar *a*, and consequently the ends of these tubes pressing against the tails of the levers or segments at *i*, *i*, the opposite extremities or segments will be forced inwards, as shewn by the dotted lines, the diameters of the balance thereby becoming smaller, although the parts have been actually expanded.

It may be necessary here to remark, that the two end pieces *b*, and *c*, and the two segments *g*, *g*, with the stems *f*, *f*, and *i*, *i*, are all to be cut out of one solid piece of metal."

[*Inrolled in the Rolls Chaple Office, October*, 1828.]

Specification drawn by Mr. Newton.

To WILLIAM WILSON, *of Martin's Lane, Cannon-Street, London, Hat Manufacturer, for his having invented or found out the Means or Principles of Extracting Spirits or other Solvents used in dissolving or rendering malleable Gums of various kinds, and other articles employed for stiffening Hats, Hat Bodies, Bonnets, Caps, and divers articles of merchandizes, and converting such Spirits (after rectification), into use.*—[Sealed 4th July, 1827.]

THE subject of this Patent does not appear to be very clearly expressed in the title, but as far as we can comprehend the specification, it seems to be the object of the Patentee to recover the spirits which have been employed in dissolving the gums used in stiffening hats, by submitting the said hats to a sort of distillation. Lest by any misconception on our part, we should have formed an erroneous notion in assuming this very extraordinary process to be the inventor's intention, we think it desirable to give the specification in his own words, referring to a rude sketch of the apparatus, shewn in Plate III, fig. 9, which, without any other explanatory remarks, is as follows:—

SPECIFICATION.

" *a*, the boiler, containing twenty gallons of water, contracted at the top to about seven inches, which is fitted with an iron or copper plate, and fastened with four screws, and flanges with two stop cocks in it, *d*, and *e*, set in brick work, and under which is a fire-place; *b*, a pipe from the boiler *a*, with a stop cock in it, fixed about three inches from the top of the boiler, by which the boiler should be filled with water; *c*, a pipe, with a stop cock in it, placed at the bottom of the boiler, to draw off the water; *d*, one of the stop cocks at the top of the boiler *a*, with a pipe leading into the steaming box *f*, for convey-

ing the steam into the box; *e*, the stop cook or safety valve at the top of the boiler, for allowing the steam to escape when not wanted, and for filling the boiler with water; *f*, a box, made as nearly steam tight as possible, three feet eight inches long, and one foot nine inches wide, and one foot eight inches deep, with a frame work of wood at the bottom, and also a small stop cock for letting off any water which may be in the box, after the completion of the process hereafter to be described.

The door *g*, in the end of the box *f*, is for putting in and taking out the hats and hat bodies; size about sixteen inches by four and a-half; *h*, a stool, on which the steaming box stands; *i*, a pipe connecting the box *f*, with the worm *l*, in the tub *k*, about six inches wide at the end next the box, and fitted to the worm at the other end.

A tub *k*, is to be filled up with water, containing a sufficient quantity to condense the steam brought from the box *f*, by the pipe *i*, whilst passing through the worm *e*, (shewn by dots), running through the tub *k*, through which the steam is to pass from the box *f*."

Then follows the description of the process for extracting, saving, and retaining the spirits and other solvents used in the dissolving, or rendering malleable gums and other articles used in stiffening of hats, hat bodies, bonnets, caps, and divers articles of merchandize, and for converting such spirits, after rectification, into use.

Fill the boiler *a*, with water, up to the cock *b*, whilst the water is heating by the fire undernea th keep the cock *e*, open, to ascertain when it comes to boiling heat. When the water is at boiling heat, take a number of hats or hat bodies, ready stiffened, sufficient to fill the box *f*, each body being previously put upon a separate block, or small wooden frame, made in the form of a cross, with a peg in

centre, in order that the hats may be kept distended. The hats are then, by means of the peg in the centre of the block, or cross frame, stuck in the frame work, lying at the bottom of the box, each hat or hat body standing free from touching the other, or any part of the box. Then shut the door *g*, (which should be as nearly steam tight as possible), open the cock in the pipe *d*, and shut the cock *e*, so that all steam from the boiler *a*, may be thrown into the box *f*.

When the hats or hat bodies have remained in the box *f*, ten or twelve minutes, the spirit and other solvents used in dissolving the gums, with which the hats or hat bodies have been stiffened, will be extracted and drawn off in vapour; and the gums will remain in the hats or hat bodies.

The hats or hat bodies are then to be taken from the box *f*, and the vapour thus extracted from them containing a great portion of spirit, by passing through the worm *e*, becomes condensed into liquors, and may be collected in a vessel placed at the end of the worm.

When the liquor which thus comes over, has stood a short time, the different spirits separate themselves, each according to its specific gravity. The spirits will require rectification before being again fit for use.

[*Inrolled in the Petty Bag Office, August*, 1827.]

To George Stratton, *of Frederick-place, Hampstead Road, in the county of Middlesex, Gentleman, for his Invention of an Improvement in warming and ventilating Churches, Hothouses, and other Buildings, which Improvements may be applied to other purposes.*—[Sealed 28th August, 1828.]

This apparatus is designed to combine elegance with utility and economy, and appears to offer one of the most convenient and effective methods of warming large apartments and public buildings that has come under our observation; besides possessiug the very important feature of heating air without deteriorating it.

The proposed form of the apparatus is that of a hollow pedestal, containing a spiral channel, through which the pure atmospheric air is made to pass in a considerable current by the upward pressure, caused by rarefaction, the spiral being encompassed by a chamber filled with hot steam.

SPECIFICATION.

My improvements in warming and ventilating churches, hothouses, and other buildings, consists in the construction of an apparatus, having one or more spiral channels, through which atmospheric air is to be passed; these spiral channels being surrounded by a hot medium, produced by a close vessel containing steam.

The manner in which I construct my improved apparatus is shewn in the drawing hereunto annexed (see Plate III), in which fig. 5, is an external view of the heating apparatus, and fig. 6, a section of the same, taken vertically. Fig 7, is an horizontal view, the top being removed to shew the interior.

The apparatus is contained in a hollow pedestal, which

may be of any convenient form dictated by fancy or taste, that is, circular, triangular, square, or polygonal. The most simple construction is that exhibited by the three first mentioned figures, in which the contrivance is adapted to a cylindrical chamber or box; *a, a,* is the outer case or hollow pedestal, enclosing the apparatus; *b, b,* is a cylinder within the pedestal, having another cylinder *c, c,* within it, which contains the spiral *d, d.*

The cylinders *b,* and *c,* are made of sheet copper, or any other suitable material; and being connected together at top and bottom, and the ends of the passage between them closed, form a close cylindrical box or channel for the reception of steam. A pipe *e,* which communicates with a boiler at a distance, conducts the steam into this cylindrical box or channel *b,* by which a heated medium is made to encompass the cylinder *c,* containing the spiral *d*; and any water which may accumulate by the partial condensation of the steam, runs off to the boiler or elsewhere by the pipe *f.*

In the bottom of the pedestal there is an opening for the admission of atmospheric air, which passing upwards, proceeds through the winding passage of the spiral, and becoming heated in its progress, passes off at top into the open part of the pedestal, and then is discharged through the ventilator *g,* into the building or apartment intended to be heated.

A perpendicular pipe *h,* passes up the centre of the spiral, as a support to the several coils of the sheet metal, by which the winding passage is formed. This pipe communicates at top and bottom, by means of short horizontal pipes, with the steam chamber *b,* and by that means allows the steam to circulate through the centre of the spiral, for the purpose of assisting to heat the air in its progress.

The ventilator is formed by two perforated circular plates sliding round upon their centre, or by other sliding apparatus of the same kind, by which the quantity of heated air passed from the spiral may be regulated.

Having described the mode of constructing my improved heating apparatus in its most simple form, I now proceed to state the manner in which I adapt several of these spirals in one pedestal or steam box, for the purpose of increasing the quantity of air heated and passed through an apparatus of this description. Fig. 8, is a horizontal section of a circular steam box *b, b*, with four of the cylinders *c, c, c, c*, passed through it, each containing one of the spirals *a*, constructed with pipes and spiral channels, formed exactly as described, with reference to figs. 6, and 7.

Any number of these spirals may be inserted in this way in a close steam box of any convenient shape, the steam being conducted from a boiler and admitted by a pipe *i*, in the centre or elsewhere, the atmospheric air being passed from below through the spiral channels, in the manner before explained, and discharged through a ventilator at the top.

[*Inrolled in the Inrolment Office in Chancery, Feb.* 1829.]

Specification drawn by Mr. Newton.

To Elijah Galloway, *of the London Road, in the parish of St. George the Martyr, in the county of Surrey, Engineer, for his Invention of an improved Rotatory Steam Engine.*—[Sealed 29th December, 1826.]

It is very desirable when a Patentee professes to have invented improvements upon a well known engine, that

he should point out specifically in what particulars his improvements consist. The subject of the present Patent is stated to be an improved rotatory steam engine, or, what is very commonly called a steam wheel.

The general features of these kind of steam engines, called rotatory, are a close steam tight drum or hollow wheel, made stationary, with an axle passing through its centre, having a leaf or radial arm, sometimes called its piston, extending from the axle, the edges of which are made to fit closely to the periphery, and two sides of the interior of the drum; when steam of considerable mechanical force, being made to act against one side of the leaf or piston, it is necessarily driven round with its axle, the rotation of which is designed to communicate power for driving machinery of any kind connected to it.

These engines are usually driven by steam of very considerable force, called high pressure, and in consequence there is great difficulty in keeping the joints of the steam wheel or hollow drum perfectly steam tight; and also of preventing the steam from passing between the edges of the piston and the internal surface of the drum. There is also another difficulty in contriving the steam stop, that is the part within the hollow drum, against which the steam must exert its elastic force, in order to drive the leaf or piston round the interior of the drum. This must either be effected by making the steam stop in a stationary position within the drum, and allowing the leaf or piston to slide out of the way in passing it, or by causing the steam stop itself to move away, for the purpose of letting the piston pass it.

The accomplishment of these objects have called forth a multitude of schemes, more or less effective; but to the present moment it does not appear that they have

been so satisfactorily adapted as to render rotatory steam engines so desirable as those upon the reciprocating principle.

With the numerous Patents before us for improvements in rotatory steam engines, we feel very considerable difficulty in describing what may be considered by the present Patentee as his particular invention.

Plate IV, fig. 6, represents a longitudinal section of this improved engine, taken through the wheel or drum in the direction of the axle; fig. 7, is a transverse section, that is taken across the axle; *a, a, a*, is the close cylindrical chamber or hollow drum, called the steam wheel; *b*, is the shaft or axle, which is intended to revolve within it; *c*, the leaf or piston, in this case a radial arm fixed to and extending from the shaft or axle; *d, d*, steam stops, formed by flat metal plates, sliding in and out of their boxes *e, e*, in order to interrupt the steam way, by forming partitions, against which the steam may exert its elastic force in impelling the piston round.

The interior of the drum or wheel must be rendered perfectly smooth and even in its surface, and all the joints packed, to prevent the escape of the steam. The piston is made of several pieces of metal, sliding against each other, and pressed outwards by springs within, so as to force their edges against the internal surface of the drum, and prevent the passage of the steam.

One of the stops *d*, (say the upper one), being slidden into the drum, and there resting as a partition, the steam admitted into the circular passage or hollow wheel, as at *f*, will exert its elastic force against the stop and against the piston, and by that means drive the piston round rather more than one half of the circumference of the circular chamber, passing the place of the lower stop, which at that time has retired into its box *e*. The mecha-

nism on the outside of the machine now causes the upper steam stop to retire, and projects the lower one into the cylinder in a manner to be hereafter described; and the steam now exerting its elastic force between the lower stop and the piston, carries the piston forward through another half of its circular journey, passing the upper stop, which is at that time retired; and thus by the alternate sliding in and out of the stops *d*, the steam is enabled to force round the piston, and continue its motion, which as before said, causes the shaft or axle to revolve, and to drive any machinery connected to it.

Steam generated in a boiler, at any convenient distance, is conducted by a pipe into the box or steam chamber *g*, and from thence passes by slide valves through passages *h*, *h*, and is admitted into the drum or steam wheel, at the induction apertures *i*, *i*, for the purpose of driving the piston in the way above described. The apertures *k*, *k*, are for the eduction or escape of the steam, after it has performed its duty, which takes place immediately on the stop next to it having been slidden from its box into the cylinder.

The steam stops are worked by the following means:—Rods *l*, *l*, extending from the back parts of the sliders *d*, are connected to longitudinal bars *m*, *m*, which carry the guides or tappets *n*, *n*, and an excentric cam affixed to the main axle (shewn by dots) working against these tappets, raises and depresses the arms *m*, and thereby causes the plates *d*, to be sliddden in and out of their boxes, in order at the proper times to form the partition or steam stops before explained.

The side valves, which admit the steam to the induction apertures, and discharge it from the eduction apertures, are worked by small cranks *o*, *o*, which are acted upon by the rotatory cams, as they go round; and by these means

the steam is alternately admitted to and discharged from the steam wheel.

As we before observed the particular features of novelty claimed do not appear from the specification. Much stress is laid upon the peculiar mode of constructing the piston, which is to consist of four pieces of brass or gun metal, shaped like the letter L, of about two inches and a half thick, made perfectly smooth, and so formed as to slide against each other, and to block or cover the joints; with springs so acting within as to force the pieces outward. This appears to be nearly the same contrivance as that of Mr. Wright's, described in the specification of his rotatory steam engine, see Vol. XII. of our First Series, p. 57, and Plate IV. These plates being accurately fitted together form a metallic packing, which is to prevent the steam from passing; and it is said, "as an additional security, there are semicircular grooves, cast in the metal plates, into which hemp or cotton is stuffed, and by pressing on the brass, prevent the possibility of an escape." The suggestion of combining hemp or cotton with metal, as a packing for high pressure steam engines, betrays a very considerable want of practical knowledge, as it is obvious that the vegetable material will be totally destroyed by the great heat of the steam, as soon as the engine is put to work.

The radial piston attached to the central shaft, and the alternating sliders for steam stops, are precisely on the same principle as in the rotatory steam engine of the Marquis de Combio, (see Vol. XIV. of our First Series, page 362, and Plate XVIII.; the only difference between the two is that in the former the passage of the steam wheel was a circular tube, and the piston consequently circular, with metallic spring packing, that of the present a cylindrical drum, the piston consequently of an oblong

rectangular form. The plates for steam stops in the former were projected in and out of their boxes by rotatory cams and toothed gear, in horizontal positions; those of the present by smooth cams, and tappets in vertical positions.

We have considered this engine as designed to be worked by steam at a high pressure, which most of the rotatory engines are when the steam blows away into atmosphere; but it is obvious that it may be worked upon the condensing principle, by connecting an air pump to its eduction aperture, which is mentioned by the Patentee; the mode of doing which is so well known that no further explanation is necessary.—[*Inrolled June*, 1827.]

To David Bentley, *of Eccles, in the county of Lancaster, Bleacher, for his invention of an improved Carriage Wheel.*—[Sealed 8th May, 1827.]

The principle improvement proposed under this Patent consists in the mode of fixing the spokes of the wheel into the nave, which is shewn by figs. 8 and 9, in Plate IV.

Fig. 8, is a view of the improved wheel, the cap-plate of the nave being removed, to shew the form of the nave box; and fig. 9, is a section of the wheel taken vertically through the nave box, cutting the felly through at right angles to its periphery.

The felly or wooden ring, which forms the periphery of the wheel, is rounded on its edge, for the purpose of receiving a convex tire, instead of a flat one, and the several pieces of bent timber, of which the felly is constructed are put together, fitting into the hollow of the circular tire or ring of iron, and are made fast by wedges.

The spokes are not to be set in radial positions, coinciding with each other, but at angles, alternately—one bearing upon the front part of the nave, and the other upon the back part, as shewn in the sectional figure 9.

Suitable mortice holes are made in the felly for the reception of the outer extremities of the spokes, which at their inner extremities are rounded and are slidden into flutes or recesses in the iron nave box; and when all the spokes have been thus inserted into the felly, and their reverse ends mounted on the nave box, the whole is rendered light, by screwing up the cap plates on the ends of the naves, which forces them home, and by so doing presses the ends tight into the fellies, and renders the wheel firm and all its parts secure.

The Patentee states that he does not claim any of the parts of this contrivance separately or distinct from the whole, but he claims a wheel made of the several parts and in the manner described, to be new and his invention.—[*Inrolled November*, 1827.]

Novel Inventions.

Differential Barometer. By the late W. Wollaston.

This instrument is capable of measuring, with considerable accuracy, extremely small difference of barometric pressure. It was originally contrived with the view of determining the force of ascent of heated air in chimneys of different kinds; but as its construction admits of any assignable degree of sensibility being given to it, it is susceptible of application to any other purpose of more extensive utility. A glass tube, of which the internal diameter is at least a quarter of an inch, being bent in

the middle into the form of an inverted syphon, with the legs parallel to each other, is cemented at each of its open extremities into the bottom of a separate cistern, about two inches in diameter. One of these cisterns is closed on all sides, excepting where a small horizontal pipe opens from it laterally at its upper part; while the other cistern remains open. The lower portion of the glass tube is filled with water or other fluid, to the height of two or three inches; while the remaining parts of the tube, together with the cistern, to the depth of about half an inch, are filled with oil; care being taken to bring the surfaces of water in both legs to the same level, by equalizing the pressure of the incumbent columns of oil. If the horizontal pipe be applied to the key-hole of door, or any similar perforation in the partition between portions of the atmosphere in which the pressures are unequal, the fluid in the corresponding half of the instrument will be depressed, while it is raised in the opposite one, until the excess of weight in the column that is elevated will just balance the external force resulting from the inequality of atmospheric pressure upon the surface of oil in both cisterns. This, however, is equal only to the difference between the weight of the column of water pressing on one side, and that of an equal column of oil which occupies the same length of tube on the other side; this difference depending upon the relative specific gravities of the two fluids, will, in the case of olive oil and water, be about one-eleventh of the weight of the column of water elevated. But the sensibility of the instrument might be increased at pleasure, by mixing with the water a greater or less quantity of alcohol, by which the excess of its specific gravity over that of the oil may be reduced to one twentieth, one thirtieth, or any other assignable proportion. The instrument may

be converted into an areometer, by closing both the cisterns, and by applying to the upper part of each a trumpet-mouth aperture, opening laterally.

AMERICAN PATENTS.

Improvement in water wheels for mills; Abel Greenleaf, of Mexico, Oswego County, New York, June 5, 1828.

The plan proposed is to employ two, or more, water wheels, where the undershot kind is used; the second wheel to be acted upon by the water, after it has left the first; the two wheels to be geared together, by an intermediate cog wheel, or to be connected by a band passing over drums upon wheel shafts, so that, in either case, the motion of the second wheel shall be about one-third less rapid than that of the first; it being estimated that the water will strike it with a power diminished in that proportion. The fall may be divided into two parts, giving such a descent to each, as shall ensure the action to be nearly in this proportion.

Improved machinery for striking bricks, called the "Ohio brick striker;" Ebenezer Duty, and Daniel W. Duty, Geaugo County, Ohio, June 7.

This machine is too complex for a short description; its principal parts are a hopper to contain the compost, a lever to force the same down into a mould under the hopper, and a carriage and lever by which the mould is forced under the striker. The machinery is not clearly explained in the specification, and there is no model deposited to aid us in understanding it. We are told, that the machine was essayed in this city, and not found to answer the expectation of the inventor; but whether this was from a fault in its principle or in its construction, we are not informed.

A machine or machinery, for making barrels, kegs, &c.; Nathanial Goodall, and Loren Tainter, Watertown, Jefferson County, New York, June 9.

The machinery consists of three parts; the first, for turning the head in a kind of lathe well, adapted for the purpose; the second, is a trough, or box, in which the stave is placed, is forced forward by a follower, and is guided and made to pass between two knives, one of which forms the rounded and the other the hollowed side of the stave. The third instrument is a frame in which jointers are made to slide by means of suitable grooves; the staves to be jointed, being secured in their proper places by means of an iron frame and cramps. The whole is worked by a shaft set in motion by any sufficient power.

An improved machine for washing, or churning; Daniel Reid, Slaterville, Tompkins County, New York, July 16.

The patents for washing machines are so numerous, and the family likeness in many of them so striking, that mere description will rarely suffice to distinguish one from another. The present machine has a box with sloping sides, and a curved bottom with a dasher similar to that of many of its congeners; the dasher is fixed, and the box made to vibrate upon pins, or springs at its upper side. The novelty claimed is the extending the sides of the box upwards, so as nearly to form a triangle, and forming the door on the upper part of the side, instead of on a flat top; by which contrivance it is more effectually closed, and the suds or cream, more completely prevented from dashing over, than in other similar machines.

An engine or machinery for propelling boats, &c. called Talbot's Atmospheric Engine; Edward Allen Talbot, late of Dublin, but now residing in the United States, granted in pursuance of a Special Act of Congress, June 21.

This will hereafter be described more at large, but as preparations are now making to test the correctnes of the principles on which it is founded, and also the force with which it will act, an analysis would at this time be premature. We will, therefore, merely state, that by the aid of two atmospheric cylinders, placed horizontally, with their open ends towards the stern of the boat, the pistons of which cylinders are to be operated upon by means of a steam cylinder or cylinders, it is proposed to obtain a power, acting within the vessel itself, without the aid of paddle wheels, or any substitute therefore, which shall propel a boat with great velocity.

Machinery for making casks, barrels, tubs, &c. Jahn Hale, Oakam, Worcester County, Massachusetts, June 21.

The staves are first formed by being forced through a machine in which a cutter, or shaver, forms the convex side, whilst a wheel provided with a number of cutters, forms the concave side; the axis of this cutter wheel is in a line with the stave, and of course, the cutters traverse the grain of the stuff to be worked.

The staves are jointed by passing under another cutter wheel, which, instead of being cylindrical, is hollowed from each edge, so as to be of less diameter in the middle than elsewhere; the staves are passed under this so that they are jointed with the required bulge in the middle. The hoops are shaved, or cut, regularly by a cutter wheel, similar to that first described, there being a regulating guide to govern their thickness.

New Patents Sealed in 1829.

To William Madeley, of Yardley, in the County of Worcester, Farmer, for his having invented an apparatus or machine for catching, detecting, and detaining depredators and trespassers, or any animal, which he denominates the human snare.—28th March, 2 months.

To Josias Lambert, of Liverpool Street, in the City of London, Esq. for his having invented an improvement in the process of making iron applicable at the smelting of the ore, and at various subsequent stages of the process, up to the completion of the rods or bars, and for the improvement of the quality of inferior iron.—30th March, 4 months.

To William Prior, of Albany Road, Camberwell, in the County of Surrey, Gentleman, for his having invented or discovered certain improvements in the construction and combination of machinery for securing, supporting, and striking the top mast and top gallant masts of ships and other vessels.—11th April, 6 months.

To John Lihon, of Guernsey, but now residing at the Naval Club House, Bond Street, in the County of Middlesex, a commander in our royal navy, for his having invented or found out an improved method of constructing ships' pintles for hanging the rudder.—14th April, 6 months.

To Henry Robinson Palmer, of the London Docks, in the County of Middlesex, Civil Engineer, for his invention of a certain improvement or improvements in the construction of warehouses, sheds and other buildings intended for the protection of property.—28th April 2 months.

List of Patents.

GRANTD IN SCOTLAND SINCE DECEMBER 6, 1828.

For an improvement in the manufacture of buttons and in the machinery or apparatus for manufacturing the same. To Thomas Tyndall, county of Warwick.

For an improvement in the making of alum. To Wm. Strachan, county of Denbigh.

For certain improvements in distillation. To Robert Stein, county of Middlesex.

For a method or principle or an apparatus for raising water or other fluids. To Anton Bernhard, county of Middlesex.

For an improvement in the construction of ships' cable and hawser chains. To John Hawks, county of Middlesex.

For an improvement or improvements on bits. To Valentine Llanos, county of Middlesex.

For certain improvements in the construction of steam engines and steam generators or boilers. To Samuel Clegg, county of Lancaster.

For certain improvements in machinery to be used in navigation, applicable to the propelling of ships and other floating bodies, &c. To Charles Harsleden, county of Middlesex.

CELESTIAL PHENOMENA, FOR MAY, 1829.

D.	H.	M.	S.	
1	0	0	0	Clock before the ☉ 3' 3"
1	2	0	0	☾ in conj. with ξ in Pisces·
1	15	0	0	☾ in conj. with o in Pisces.
2	19	57	0	Ecliptic conj. or ● new moon
4	0	0	0	☿ in conj. with ♀ long. 9½° in Aries. ☿ lat. 1° 5' S. ♀ lat. 55' S. diff. lat. 10'
4	9	0	0	☽ in conj. with 1 δ in Taurus
4	10	0	0	☽ in conj. with 2 δ in Taurus
4	15	0	0	☽ in conj. with α in Taurus
5	0	0	0	Clock before the ☉ 3' 29"
9	14	0	0	☽ in conj. with 2 α in Cancer.
10	0	0	0	Clock before the ☉ 3' 49"
10	7	0	0	☽ in conj. with ζ in Leo.
10	7	36	0	☽ in □ first quarter.
10	12	0	0	☽ in conj. with o in Leo.
10	22	0	0	☽ in conj. with π in Leo.
11	0	0	0	♅ Stationary.
12	20	0	0	☽ in conj. with τ in Leo.
14	0	0	0	☿ in conj. with A in Taurus
15	0	0	0	Clock before the ☉ 3' 56"
15	1	0	0	☽ in conj. with θ in Virgo.
16	9	0	0	☽ in conj. with η in Taurus
17	23	0	0	☽ in conj. with γ in Libra.
18	7	48	0	Ecliptic opposition, or ○ Full Moon.
18	8	0	0	☾ in conj. with θ in Libra.
19	0	0	0	☾ in conj. with φ in Oph.
20	0	0	0	Clock before the ☉ 3' 48"
20	21	31	0	☉ enters Gemini.
23	1	0	0	☾ in conj. with β in Capri.
25	0	0	0	Clock before the ☉ 3' 26"
25	3	0	0	☾ in conj. with θ in Aqua.
25	8	19	0	☾ in □ or last quarter.
28	9	0	0	☾ in conj. with ζ in Pisces.
28	23	0	0	☾ in conj. with o in Pisces.
30	0	0	0	Clock before the ☉ 2' 52"

METEOROLOGICAL JOURNAL, FOR MARCH AND APRIL, 1829.

1829.	Thermo.		Barometer.		Rain in inches.	1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig't.	Low.			Hig.	Low	Hig.	Low.	
MARCH						APRIL					
26	48	30	29,92	29,86		11	56	39	29,56	29,50	
27	46	33	29,92	29,81		12	57	43	29,22	29,18	,5
28	54	24	29,63	29,47		13	49	45	29,19	29,10	,25
29	48	37	29,30	29,26	,25	14	58	36	29,21	29,00	,05
30	45	35	29,22	Stat.	,125	15	54	43	29,26	29,00	,375
31	44	36	29,26	29,19		16	47	40	29,26	29,22	,05
AP. 1	47	32	29,39	29,32	,025	17	53	34	29,73	29,54	,375
2	46	24	29,50	29,39	,025	18	58	47	29,73	29,60	,075
3	47	27	29,64	29,56		19	52	35	29,63	29,60	,175
4	54	32	29,65	29,60		20	53	35	29,81	29,63	,075
5	53	39	29,36	29,23	,2	21	55	31	29,81	29,62	,075
6	53	40	29,16	29,12	,025	22	48	42	29,54	29,46	,05
7	49	33	29,13	29,26	,35	23	59	39	29,70	29,62	,25
8	49	29	29,36	Stat.	,05	24	47	42	29,73	29,66	,025
9	47	35	29,26	29,16	,075	25	42	40	29,96	29,73	
10	54	35	29,46	29,36	5,						

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XV.

[SECOND SERIES.]

Original Communications.

ART. IX.—ON THE COMMITTEE OF INQUIRY UPON THE LAW AND PRACTICE OF PATENTS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—I beg leave to transmit to you herewith a copy of a communication, which I took the liberty of sending this day to Mr. Lennard, Chairman of the Committee of the House of Commons on Patent Laws. By giving it a place in your valuable Journal, you will oblige me, as by affording publicity to my ideas on these subjects, I may perhaps contribute a mite to the great good of effecting a salutary change so loudly called for by justice and policy. From the measures already taken by the Legislature, I sincerely hope that the desired end is in a fair way of being obtained.

I remain, respectfully, Gentlemen,

Your most obedient servant,

M. DE JONGH.

Manchester, 18th May, 1829.

(COPY.)

Manchester, 18th May, 1829.

Sir,—As communications on the subject of Patent Laws may prove beneficial to your laudable investigations and labour, I take the liberty to submit to you the following considerations.

The intent of the Legislature in granting Patents for inventions is, I believe, understood to be for the purpose of promoting the public good, combined with commensurate reward to the inventor, and which at the same time stimulates and encourages the cultivation of the human intellects to the great benefit of the arts and sciences. To do strict justice to these points, is, I fear, beyond the reach of human power; I submit that in most cases of what are called inventions, it is most difficult to estimate their merits or demerits as inventions, and consequently whether they are or are not entitled to limited monopolies, to the advantage of the claimant and to the prejudice of the public.

So is it likewise difficult to determine what shall constitute infringements of one supposed invention on another, especially in mechanism.

No machine can be constructed without recourse to the elementary principles of mechanism, and the combination of individual parts used as agents; in like manner as in the composition of this address, the words I use for the formation of sentences, subservient to what I mean to express, are so many individual parts used as agents combined together upon certain principles, or according to certain studied methods to produce a desired effect, and as by dint of man's ingenuity the combination of words may be multifariously varied by making use of them in a variety of ways; so may likewise the effects of machines be varied by applying the different parts in various ways; and again, the same words differently combined may produce another sentence, or (in other words) a new effect. So may the elementary parts in mechanism also differently combined produce new effects. Both cases admit of substitution of agencies, and variety in the principle of using them, to produce one and the same effect, or new effects.

Let us suppose a clever person forms such an arrangement of words as to produce the effect of describing in an agreeable manner the beauties of nature, and that another person improves upon that production by a better composition to the same effect. Both have merit and both are entitled to reward, but the proportion of their respective rewards ought to depend upon that of their respective merits, and it appears evident to me, that it would be as unjust to deprive the first composer of his reward as it would be to adjudge all the reward to him, to the exclusion of the second, which unfortunately is often the case in our present Patent Laws and practice, especially when litigations take place on original inventions, and inventions for improvements in mechanism.

As for instance, A. invents a useful printing press (supposing that such a machine was not known before), for this he claims and obtains a Patent; B. examines this press, works it, and studies it, which forms the very seed of a second invention by B. for an improved press—he also claims and obtains a Patent; and although B.'s press is different from that of A.'s in some things, or in many things, yet it is its offspring, it is an apple grafted on a crab tree, which most likely would never have existed if the crab tree were not in being. The talents of B. having been added to those of A. have produced the improved press; B. runs away with all the reward (that of A. being inferior can find no customers), to the great prejudice, perhaps the ruin, of A.! Can it then be said that A. had justice done him? No, certainly not. Such proceedings must naturally check and damp the exertions of talented men, when original inventions present themselves to their views. On the other hand, it often happens that in cases similar to the one mentioned, A. brings an action against B. for infringement on his Patent right, gains his cause, to the prejudice of B. Must not this discourage attempts at improvements of patented machines?

It may perhaps be asked cannot A. find out such improvements? is he not most able to follow up his own inventions

by improvements? I answer—no. However clever a man may be, yet having intently applied persevering study and labour to one object, it commonly happens that his powers of invention on that subject become weaker than they were at first.

And, secondly, as no specification can be altered after it is once enrolled, the enormous expenses of fresh Patents at every improvement cannot be borne without a prospect of ruinous consequences to the inventor.

Minute reflections on these points lead to the following question:—

How and where can the exact line be drawn of what is and is not a new invention, and of what is and is not an infringement. What rule—what law—can be laid down to define its exact demarcation, not subject to various interpretations? In my humble opinion none—I think it impossible; but, that some few professional men, from their situation in life, endowments by nature, their turn of mind and studies, their education, and from a variety of other circumstances, are far better able to sit in judgment upon these delicate points than the multitude at large, indiscriminate juries, and even the Judges of the land, I firmly believe to be the case. I therefore beg leave to submit to your consideration, that a properly constituted court composed of the kind of men before described, should judge Patent causes subject to appeals to other courts, where the setting forth the grounds of their decisions would throw such strong light upon the merits of the points at issue, as would best enable ordinary Judges to get clear conceptions of the cases before them.

The pleadings of counsel, as at present, are of no assistance to the Judge; for not only that such matters do not often come within the pale of barristers' studies, but their very study is not to expound truth and sound reasoning in their pleadings, but the great art of making it appear so, for the benefit of their client, wherewith their private opinion sometimes coincides and sometimes is at variance.

I think it unnecessary to trouble you with any observations

of mine respecting the enormous charges of Patents, granting Patents before the claimants set forth what they are for; preventing specifications being altered and amended; Patents voided, when any part, however trivial and insignificant, compared with the whole, proves to be not new, and the necessity of taking out three Patents for nominally three kingdoms, but under one reign and one principal constitution, as you are no doubt fully alive to them.

In a former communication, I took the liberty to suggest to your Committee the perusal of what was published in the London Journal of Arts and Sciences, on the subject of Patent Laws, for the six months from November last year to April this year, both inclusive; and I shall further be happy to contribute by every means in my feeble power to the amelioration of these laws, which so loudly demand a salutary change to take place. I feel it besides to be my duty to devote all my efforts to the public good, if it can thereby be benefited in the smallest degree.

I am, with the greatest respect, Sir,

Your most obedient, humble servant,

(Signed) M. De Jongh.

To T. B. Lennard, Esq. M. P. Chairman of the Committee on Patent Laws, London.

Art. X.—On the Fees and Charges upon Chancery Patents for Inventions.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—The loss of ancient records and the general suppression of official documents, relative to aids raised "*by pretence of prerogative*" for it soccasions, or for those of its state-officers, involve the question of what fees of office are not of ancient usage in some degree of obscurity—but we have sufficient remaining lights to prove that the *present* fees demanded

and paid for Patents are neither of ancient usage nor authorized by Act of Parliament. The difficulties to be encountered in making researches, and in ascertaining when and in what manner the several additions to the ancient fees have been made, and new pretences established, impose upon me the necessity of requesting the indulgence of your subscribers, in order to enable me to arrange and place the argument in the clearest view,—I trust it will lose nothing in strength by the delay—overwhelming conviction to the mind of the most *interested supporter* of the system, is my object. Dismissing the legal points of the argument for the present, I will return to the consideration of the *occasional charges* upon Patents, which originated its necessity; of these—the additional fees demanded for the insertion of more than one inventor's name in a Patent, present a conspicuous instance of the auri-mania and absurd pretensions of the system.

In the year 1825, and previously for some years, the modern charge of Mr. Attorney General for the insertion of two names as joint inventors, in his valuable document the *Bill*, without a single addition to its usual tautologies and unmeaning verbosity, on account of such increase to his labour, was 22*l*. 19*s*.; his charge for his bill with one name being then 18*l*. 19*s*.; so that, for the important and extraordinary labour of inserting Richard and Thomas, instead of Richard only, 4*l*. were charged.

About that period as I am informed, some symptoms of discontent, not to say *mutiny*, were manifested, as to the payment of the charge, which produced the interference of the present Lord Chancellor, then Master of the Rolls. Another explosion of Mr. Attorney General's fees took place (besides that noticed vol. 2d, p. 313), which reduced this imposition from 4*l*. sterling gold, to the insignificant sum of half-a-crown silver coin. With this sum of two shillings and sixpence, for the insertion of each name of a co-inventor, Mr. Attorney General has been since content.

Had the spirited reform commenced by his Lordship been then extended into an inquiry into the *legality of all fees* demanded,

including the State charges and those of his own great hanaper, my *dissection* of them would not be now necessary; and the Committee of Inquiry might have been saved the unpleasant task of asking many inconvenient questions upon delicate subjects, which I trust the "*erroneously impressed*" public will strongly insist upon being sifted to the bottom. By the time my exposé is concluded, I think their "*unfortunate general delusions*" upon these matters will terminate in something like illumination.

If internal evidence, as the divines call it, were wanting as a demonstration of the illegality of the fees and charges generally, as now demanded and made upon the issue of Patents, here we have it complete.

Professional tenacity of fees that *can* be retained is a characteristic of public officers generally, but in lawyers it is *very nature*—it is the imbued habitof life—the esprit du corps, which sensitively feels the foul dishonour of individual surrender of fees.

That a learned Attorney General instinctively looking to his fees, as matter of settled right, with every opportunity of ascertaining the origin and extent of that right, should relinquish upon *suggestion* of his superior, the charges of 3*l.* 3*s.* and of 4*l.* upon a single document issued from his office, is convincing, internal, indisputable evidence of the ILLEGALITY of those charges. If more be wanting—take the fact that the relinquishment was made in that year of golden harvest to the Great Seal and its dependants, when two hundred and forty seven English Patents were issued. Two hundred and forty seven multiplied by 3*l.* 3*s.* produce 778*l.* 1*s.*—add an average of about fifty additional names at 4*l.* each, making 200*l.*—Total—nearly One Thousand Pounds relinquished in one year from *compunction*—not *compulsion*!!

The additional charges at the Secretary of State's office upon the warrant and sign manual for each name of a coinventor are 1*l.* 7*s.* 6*d.* State motions must be well oiled, and Hume, in his 3d Essay, p. 2, truly observes, "Money is the

oil which renders the motion of the wheels more smooth and easy."

The additional fees and gratuities at the Signet Office stand thus:—

Fees of the Signet for two names in a Patent of invention 10*l.* 5*s.* 6*d.* being more than double charge upon the first name. For three names 13*l.* 8*s.* 6*d.* being more than treble charge upon the first name. Then follow with kindred sympathy and equal exhorbitance, the additional charges of the Privy Seal for more than the first name in a Patent;—viz. for two names 10*l.* 6*s.* which is just an exaction of 5*l.* 18*s.* 6*d.* for this "*State-nothing*," and for its cousin *Fai-neant*,* of three names 12*l* 15*s.* 6*d.* being above three times the amount of charge for one name.

In this united office of imposition and oppression, (for I will take leave, as Wilkes says, "*to call a cat a cat*"), the Signet and Privy Seal consequently take from, inventors the sum of 11*l.* 17*s.* in the event of two names being upon the Patent, and of the sum of 17*l.* 15*s.* in case of the insertion of three names. This is beyond the original charge of 8*l.* 9*s.* (which includes the stamp duty upon *the warrant*) levied on the first name, for absolutely doing nothing "*at all—at all*," as our Irish senators would forcibly express it. If this be not a system of bare-faced plunder, beyond the power of language to describe, I am at a loss to conceive what may be justly so named.

Mr. De Jongh cautiously suggests that the system in some of its featutes *bordered* upon iniquity; I apprehend upon this exposure of its operations, he will join me in opinion, that it is *iniquity exemplified.* The blood rises at the united absurdity and arrogance of setting up such enormous charges for *no service whatsoever* performed by the officers of the Crown.

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* Fai-neant. The addendum to the titles of Charles VI. of France, whose subjects honoured him with the name of *King Do-nothing.*

I here publicly call upon the Committee of Inquiry fearlessly to do their duty as Legislators and men. I call upon them uprightly and boldly to grapple with the system of extortion which I here denounce—and beat down this Hydra of oppression. I call upon them to rescue the inventive talent of the country from this insupportable misuse of the prerogative by its officers.

The charges of the Great Seal for the addition of each name beyond the first upon the Patent are 2*l.* 13*s.* 6*d.* This sum is paid into the great wide gaping hanaper, *i. e,* it goes directly to my Lord Chancellor, in support of his general "*State.*" Upon an inspection of the "Order of Fees," made 17 Geo. II. A. D. 1743, under Lord Hardwicke, Chancellor, I am induced to think that the "gentlemen of the chamber" receive a share of this modern *tallage* upon the subject.

We now pay a return visit to Mr. Attorney General.

When an opposition to an invention is made or got up, which is often effectually managed by means of a caveat, entered with the erroneous idea of securing your invention whilst you proceed with the completion of the details, an attendance upon Mr. Attorney or Solicitor General is required. One guinea is paid for the caveat, which entitles you to the service during one year of notice of all applications for Patents which may be supposed to interfere with your invention. The caveat may be renewed annually upon payment of a second fee.

An inventor is naturally eager to secure his discovery; some other men are as naturally eager to ascertain what it is, and to endeavour to forestall if it be deemed worth the trouble. The ensuing oppositions are heard by Mr. Attorney or Solicitor General, who is as likely to understand the merits of the case generally, as a soldier does of the tackle of a main sail. However the *fees* pour in upon each hearing,—3*l.* 10*s.* from the inventor, including summons,—and 3*l.* 5*s.* from the opposing party, and an allowance to the

Solicitor of each party of 13*s.* 4*d.* Each hearing is therefore attended with an expense to the parties of 8*l.* 1*s.* 8*d.* Generally an opposition is dispatched in one hearing. But this charge is certainly an excessive and unwarrantable tax upon the public. The mischief seldom ends here, for the unfortunate inventor has frequently, under the present wretched system, to contend with several oppositions, or to make frequent expensive appeals in support of his just rights.

An inventor has within a few days informed me, that in support of an invention which was recently announced in your Journal, he had to appear by his Solicitor to no less than *eighteen oppositions*, at an expense of nearly 100*l.* to himself. Upon eighteen attendances,—fees to Mr. Attorney General, at 3*l.* 10*s.* each, amount to 63*l.* for the inventor; and eighteen at 3*l.* 5*s* each, are 58*l.* 10*s.* for the contrary side, besides their other expenses; consequently upon this single affair, Messrs. the Attorney and Solicitor General, who divide the fees, received One Hundred and Twenty One Pounds and Ten Shillings!!!

Say, ye Statesmen and Legislators, who find it not desirable to facilitate the obtaining of Patents by any reduction of expensé—who start with alarm at the consequences of the unfortunately general "*erroneous error*," of the impression that it *is* expedient to facilitate the taking out of Patents—say if this system of oppression and absurdity ought to be continued—if it be conducive to the promotion of the arts and manufacture of the country;—if an heterogeneous mass of antiquated pretensions—of fantastic operations—of absurd practices—and of illegal impositions—is to be retained for the sole advantage of a few State officers and subalterns, in defiance of common sense, of common honesty, and of the universal feeling of society. Men of skill, intellect, sense, learning and nerve, are in decided opposition to all attempts to bolster up this most rotten part of a decaying order of things. Establishments can now be only supported by their adaption to the wants of the community—acquiesence in the

claims of established institutions in the present day, can in this country be alone the result of conviction as to their utility.

Connected with the subject of oppositions and hearings before Mr. Attorney General, a curious piece of information has been lately given me. I am told that a gentleman *connected with the office* undertakes, upon payment of 10*l.* by the inventor, to carry him through all hearings and oppositions. If this be so, and the proposal was generally understood and acted upon by inventors, a subtraction from their pockets to the amount of 1,500*l.* to 1,600*l.* per annum would be effected for this article of service;—it is undoubtedly better to pay ten pounds to a certainty, than to run the chance of paying sixty to one hundred pounds.

Whether Mr. Attorney General be informed or not of this mode of letting out his services, or if he participate in the profits of the contract, I know not; but if the fact be so—the new firm should stand—Messrs. Attorney and Solicitor General, * * * * * and Co.

We will for the present take our leave of the legal fraternity with a pax vobiscum, and prepare for a country excursion to my Lord Privy Seal; in order to facilitate the public business, a journey must be made to his Lordship wherever he happens to be.

This journey of my Lord's Deputy to procure the Privy Seal, which his Lordship always carries with him, ought in common justice to be made at his Lordship's expense, and not at the expense of the Patentee. I again refer to this occasional charge on account of its frequency, the oppressive amount to which it is sometimes carried, and its absolute illegality in toto.

There is seldom a bill of fees made out from the Privy Seal Office, in which some charge for "journey to the Lord Privy Seal," is not inserted. Possibly three out of four warrants to the Lord Chancellor, under the Privy Seal, are subjected to this tax. As to an average being estimated of its amount, there is great difficulty. I had moderately stated in

a former number, that this journey was sometimes charged to the amount of 5*l.* 5*s.* I have since learnt, to my great surprise, that this charge has been in some instances carried as high as 20*l.!* An additional hardship upon the inventor is, that he can seldom gain any information about this extravagant charge until he is obliged to pay it. Upon what principle of reason, justice, or law, this shameful charge upon an inventor is made, I am utterly at a loss to conceive.

If the Privy Seal be an instrument necessary for the public occasions (and as connected with, and preceding to the operation of the Great Seal, it is a *public* instrument), it ought in common sense to be constantly in an office, or under the care of an officer *in London*, as the Great Seal is. If my Lord Privy Seal, for his recreation or convenience, find it necessary to be at a distance from town with the Seal in his pocket, common justice requires that *he* should pay for the journey of his deputy.

But the fact is, that the Signet and Privy Seal are virtually mere *appanages* of royalty, not originally attached to the grant of Patents under the Great Seal;—for charters and public instruments were passed under the Great Seal centuries before any officer was appointed for the custody of the Signet and Privy Seal; indeed, the Signet is to this day generally in the keeping of the King himself. And although the treatise "Jus Sigilli," supposed to be written by our learned Selden, states the established course of proceeding for a Patent under the Great Seal to be, according to the present practice, by warrant under the Signet to the Lord Privy Seal, and then by warrant under the Privy Seal to the Lord Chancellor, yet it is evident from other authors and existing documents, that the ancient custom was otherwise.

As therefore the Signet and Privy Seal were not anciently necessarily connected with the operations of the Great Seal, and the warrants issued under them are absolutely mere matters of form, totally unnecessary to the transaction of public general business, and as their operations are attended with

immense harrassing and uncertain, but extravagant charges to individuals; it follows, that even if Patents under the Great Seal, for inventions, are to be continued, instead of some more simple and effective mode of securing them—the intermediate, expensive, and absolutely useless issue of two warrants under the Signet and Privy Seal, may be dispensed with;—their demands' certainly ought not longer to be tolerated.

There is another occasional charge, which, amidst the complexity of this State affair, had nearly escaped my notice.

It is the charge made at the Privy Seal Office for a *private* Seal of the *Privy Seal*. The fees upon this operation amount to the sum of 3*l*. 3*s*. This costly aping, if I may be allowed the term, of the *private public* Great Seal, appears to be entirely discretionary with my Lord as to the time when the *private privacy of the Privy Seal* shall be announced. My Lady's card-party or rout, may sometimes have a barometical influence upon the decision. However, his little godship *does* occasionally retire from our wondering gaze, as do the miraculous eyes of the Virgin Mary in the shrine of Loretto, but like them it again presents itself with benignant aspect upon the touch of gold.

I will boldly declare, that if any assumptions and exactions should be assigned to the unmoving finger of public scorn and opprobium—those of the Signet and Privy Seal Office may challenge a pre-eminent situation. The charges therein made are altogether of the most oppressive and illegal character. The major part of them, as well as the modern charges and increase of fees in other offices, are levied without any legal authority whatsoever, and I publicly invite the learned and noble holders of the offices connected with the grant of Patents, to shew upon what authority they do claim and receive the fees charged. If it would be too condescending on their parts to notice this invitation, or to explain the supposed right by which they levy *twenty thousand pounds* per annum upon inventors, in the very outset of their discoveries, for services and *no services*,—I trust the Committee of Inquiry, upon the

information they may now obtain, will throw open the darkest recesses of this long continued and strongly cemented system of evil, pretension and absurdity. In proportion as the private interest of several of the Committee, militates against these disclosures, in that ratio will the public attention be fixed upon their proceedings, and the public jealousy be directed to their determination. The Committee cannot retreat from this subject without disgrace—but they may advance crowning their path with dignified honour, amidst the cheering approbation of every man of intelligence throughout the empire.

I remain, Gentlemen,

Your most obedient servant,

VINDICATOR.

Recent Patents.

To THOMAS TYNDALL, *of Birmingham, in the County of Warwick, Gentleman, in consequence of a Communication made to him by a Foreigner residing abroad, for Improvements in the Manufacture of Buttons, and in the Machinery or Apparatus for manufacturing the same*—[Sealed 4th Dec. 1827.]

WE have scarcely ever had the pleasure of laying before our readers an invention possessing pretensions as to originality, design and ingenuity of construction, equal to that which forms the subject of the present Patent. This invention is the offspring of the inexhaustible genius of Dr. Church, of America, communicated to the Patentee when the inventor was absent from England.

The improved manufacture is a button constructed in a peculiar way, with a metallic shank, the face of which button may be either of polished metal, or covered with a fabric, such as silk florentine or other suitable material. But the leading feature of the invention is a machine, by which the turning of a winch produces all the manipulation necessary for the formation and completion of a button, similar in appearance, though superior in quality, to those usually worn upon clothes.

The various operations of shaping the discs of the buttons, forming the shanks, cutting out the pieces of cloth, and covering the faces of the buttons, being all effected by the agency of one revolving shaft, the machine as a whole may appear in some degree complicated, but upon a careful examination it will be seen that each movement is simple and unerring, being effected by means of cams.

We have much pleasure in being able to say that this invention is not chimerical, which is sometimes the case with projects exhibiting considerable ingenuity, but that it is actually making the kind of buttons described, some specimens of which produced in this machine we have in our possession.

SPECIFICATION.

This invention consists in the construction of a novel combination of mechanism, constituting a machine in which buttons for clothes may be made with considerable expedition, and in a more perfect manner both as to form and construction, than has been effected by any means heretofore employed.

The accompanying drawings (see Plate VI.) exhibit the machine in several views. Fig. 1, is a front view of the machine, shewing all the parts that can be seen on the front side drawn geometrically. Fig. 2, is a back view of the same, some of the parts being exhibited in section to

shew the construction of the machine more perfectly. Fig. 3, is an end view, in which several of the parts are seen, that could not be rendered evident in the back and front views. In these and the subsequent figures of the drawings the same letters refer to the same parts of the machine.

In order to render the construction and operation of this machine perfectly evident, I shall first describe in a general way what kind of button it is intended to produce. The machine is designed to manufacture *metal buttons* for clothes, and also *covered buttons* for the same use, but with a peculiar sort of shank.

The shank, for the back of the intended button, is formed by raising a convexity in the centre of a metallic disc, with four or any other number of holes formed in it, pierced and shaped in such a way as to form a straight passage for the needle and the thread (when sewing it on) through opposite holes, parallel to the face of the button; which piercing and forming of the metallic disc into a shank, is effected by a succession of moving dies.

The face of the said button is made from a disc or circular piece of metal, or metal and cloth, or any other suitable materials, which are united together and to the shank after the ordinary manner of making shell buttons; and these operations are effected in this machine through the agency of the carrying parts and the several dies, in the manner about to be described.

Previous to explaining the particular movements and operations of the several parts of the mechanism, I think it desirable to point out the Four principal roots of action, which are seated in the main shaft, and will be seen by reference to the accompanying drawings, A, A, A, being the main rotatory shaft of the machine.

First, excentrics, B, B, are fixed upon the shaft, for the

purpose of actuating the upper die or punch box C, C, through the agency of the connecting rods D, D.

Second, the excentrics E, E, (also fixed on the main shaft, are for the purpose of actuating the lower die or punch box F, F, through the agency of the connecting rods G, G.

Third, a cam H, attached near the centre of the main shaft, is for the purpose of driving the wheels I, K, L, M, and N, which carry the several pieces intended to constitute the button. This cam H, drives the said wheels, through the agency of the curved lever O, the pall P, the ratchet wheel Q, the shaft R, and the geer work S, T, U, V.

Fourth, cams W, W, fixed near the extremities of the main shaft, are for the purpose of moving the frame X, X, which carries and feeds in the florentine or other material (wound upon the roller Y,) of which the faces of covered buttons are to be made; the movements of this frame or carriage being effected through the agency of the vertical slides Z, Z, the right angled levers *a*, *a*, (connected to the slides), the palls *b*, *b*, and the horizontal ratchets *c*, and *d*, fixed to the said frame or carriage X, X.

Let it now be supposed that I am about to make that description of button, the face of which is covered with florentine. The roll of florentine is suspended, as at Y, in the sliding frame or carriage X, the edge of the material being drawn off the roll, and placed between the feeding chaps *e*, *f*, seen in the end view, fig. 3, but more evidently in the auxiliary figs. 4 and 5. The piece of florentine is advanced about an inch and a-half beyond the feeding chaps, on to the feeding board *g*, its edge being introduced into a narrow slit, under the circular cutters or shears *h*; and here it may be observed that the carriage, with the florentine so placed, is intended to be slidden to and fro by the operations of the machine hereafter to be described,

for the purpose of cutting out ranges of circular pieces from the end of the florentine.

Before commencing the description of my mode of making a button, it will be necessary to explain the peculiar construction of the wheels I, K, L, M, and N, and to point out their particular offices. For this purpose I must refer to the auxiliary fig. 6, which represents the appearance of the said wheels on the upper side, in which there are three different parts of the button to be acted upon by the several punches or dies, for the purpose of forming, bringing together, and uniting them.

The wheel N, is a circular plate of metal, about a tenth of an inch thick, having four holes equi-distant from the centre and from each other. These holes are formed with rabbets round them, in which rings are fixed with "chambered" apertures, corresponding in size with the circular pieces of florentine; (a section of the chambered ring with a portion of the wheel N, is shewn at fig. 7.) A disc of florentine, after having been cut out by the circular sheers *h*, is deposited in the chambered ring of the wheel N, for the purpose of being conveyed into the space between the wheels L, and M, there to be united to the shell, which shell is at the same time brought immediately over it by the wheel L.

The disc of metal which is to constitute the shell of the button, is to be placed by hand in the rabbeted tube or drawing block *i*, (see fig. 1), where it undergoes the operation of what is technically called "drawing through," by the descending punch, and is thereby deposited in the corresponding cylindrical hole of the wheel M, and is carried by the rotation of the wheel into the situation, where it is transferred to the wheel L, to meet the disc of florentine before described.

The disc of metal of which the shank of the button is

to be formed, must be deposited in a tube *k*, (see fig. 1), where the descending punch pushes it down into the corresponding hole of the wheel I, and is, by the rotation of that wheel, conveyed to the wheel L, to be united in the lower wheel K, with the shell and its covering of florentine.

The dies or punch boxes being made to approach towards and recede from each other, by the rotation of the main shaft A, as before described, the faces of the upper and lower series of punches 1, 2, 3, &c. &c. are brought together in the holes of the wheels I, K, L, M, N, for the purpose of forming and uniting the parts of the button, in the following manner. (The progress of the several parts of the button being exhibited in the auxiliary group of figures, 8.)

A hole of the wheel M, marked 1, receives the shell of metal from the drawing block *i*, by the descent of the punch 1, fixed to the upper box c, and which, in its progress through the drawing block, has its edge raised as represented in the auxiliary figs. 8, at the section No. 1; from whence it is carried round by the wheel M, to the next pair of dies or punches 2, and so on, by the following means:—

At every rotation of the main shaft A, the cam H, drives the curved lever O, through about one-fifth of a revolution, and the pall P, attached to an arm extending downward from that curved lever having hold of the ratchet wheel Q, which has five teeth, consequently drives that wheel and its shaft R, round one-fifth of a revolution, the lever returning again as the cam recedes by the power of a spring; this movement of the shaft R, carries the wheel I, also one stage, that is one-fifth of a revolution forward, and the toothed wheel S, at the lower end of the shaft R, taking into the wheel T, causes the train of toothed wheels

T, U, and V, and their shafts to be driven round, and consequently at every movement of the bent lever O, and its pall P, that is at every revolution of the main shaft, the carrying wheels I, K, L, M, N, are moved one stage, by which the shells, covering pieces, and shanks are successively brought under the different dies, and the button completed. The shell of the button now advanced to the hole at 2, is by the approach of the die boxes C, F, pressed between the upper and lower dies 2, 2, and its edge is further bent round, that is gathered in, as shewn in section fig. 8, No. 2. The upper die 2, being made concave, the lower one flat. At the next movement of the wheels, the shell is brought to the situation of the hole 3, fig. 6, which coincides with a hole in the wheel L. The descent of the upper punch 3, now pushes the shell out of the wheel M, into L, where it remains ready to be carried at the next movement, to be united to the disc of florentine.

I have already stated that the disc of florentine has been placed in the chambered ring of the wheel N, at the hole marked 4, in fig. 6; it is only therefore necessary to observe, that the movement of this wheel by the means before described, having brought the disc of florentine to the situation marked 5, fig. 6, the upper punch 5, in its descent, pushes the shell down, carrying the disc of florentine before it, into the hole of the lower wheel K, where the edges of the florentine are turned up, enclosing the shell, as shewn at No. 5, fig. 8.

I now proceed to explain the manner of preparing the shank, and of bringing it forward, to be united to the shell and covering.

I stated above, that a disc of metal was to be deposited in the elastic tube k, fig. 1, for the purpose of making the shank of the button. This disc is now forced down by the descent of the upper die 6, into the hole 6, of the wheel I,

where it is pierced with four small holes by punches fixed in the upper die, as shewn at No. 6, fig. 8.

The next movement of the wheel I, brings the shank piece to the situation 7, fig. 6, where, by the approach of the dies 7, 7, the holes just pierced are now countersunk, and the central part of the disc raised, as seen at No. 7, fig. 8. The next movement of the wheel I, brings the shank to the situation 8, where the dies pinching it, raises the centre still higher, and rounds up the metal between the holes. Another movement of the wheel I, carries the shank to 9, fig. 6; the situation where the operation last described is repeated, and the shank completed, as shewn edgewise at No. 9, fig. 8.

The succeeding movement of the wheels L. K. conducts the shell, with its covering, to the situation 10, fig. 6; and at the same time the wheel I, brings the shank piece also to the situation 10, immediately over the shell. Here, on the approach of the dies 10, the edge of the florentine is gathered in over the edge of the shell, by a small apparatus about to be described; and the shank piece is introduced into the recess at the back part of the shell, carrying in the edges of the florentine before it.

This apparatus for gathering in the edge of the florentine is exhibited at No. 10, fig. 8, where a portion of the wheel K, is represented in section. Each hole of the wheel K, receives a metal box a, a, in which four vertical levers b, b, are mounted upon fulcrum pins. The upper ends of these levers are formed into segments c, c, of a horizontal circle, the inner edges of which segments embrace the shell and covering of the button, as shewn in the figure. On the approach of the lower punch 10, a conical collar fixed thereon, comes against the tails of the levers b, b, presses them outwards, and the segments c, c, at the upper ends of the levers consequently being

forced inwards, gather and compress the edge of the florentine; at the same time the upper punch 10, pushes the shank piece out of the wheel I, down upon the shell and its covering, as shewn at No. 10, fig. 8, and forces it into the recess at the back of the shell; by which means the edge of the florentine is pushed in, under the bent-up edge of the shell, when, by the pinching of the dies, the shank piece towards its edges is flattened down, and expanded within the shell, which lock the several parts of the button together.

The next movement of the wheels brings the button into the situation 11, fig. 6, where the approach of the dies firmly closes the parts, and finishes the button. Another movement of the wheels brings the button to 12, fig. 6, where the descent of the punch 12, discharges it from the machine.

Fig, 9, is a horizontal representation of one of the punch boxes, the sockets, into which the stems of the punches are inserted, being cut through in section, in order to shew the binders and their set screws, by which the punches are fixed.

I shall now proceed to describe that part of the apparatus, which is designed for supplying or feeding the machine with florentine, and cutting out the circular pieces or discs, for covering the shells of the buttons, in the way above explained. The florentine or other material having been tightly and evenly wound upon a roll, is placed in the sliding carriage X, in the situation shewn at Y, in the back part of the machine. The pivots or ends of the roller are suspended upon levers *l*, *l*, mounted in the side standards of the carriage X, and weights are attached to the levers for the purpose of pressing the roll of florentine tightly against the top board. A portion of the florentine is drawn off the roll, and laid evenly upon the

feeding board *g*, having been passed between the feeding chaps *e*, *f*.

The carriage X, is now slidden to the extremity of its range upon its railway *m*, *m*, *m*, at the back of the machine, one corner of the florentine being passed into the slit, in the cylindrical cutter *h*, a particular description of which cutter is exhibited in section in the detached fig. 10.

The machine being now put in action, the descent of the upper punch box C, will cause the pin *n*, affixed to the punch box by a bracket, to come down upon the top of the cylindrical cutter, and to force it through the florentine, so as to cut out the disc, and push it into the chambered ring of the wheel N, as before said, and as will be evidently seen in fig. 10.

The particular construction of the cutting cylinder requires now to be explained. It consists, in the first place, of an outer tube of cast iron marked *h*, in the figs. 2, 3, & 10, which tube is firmly attached to the feeding board, *g*. Within the outer tube *h*, a cylindrical tube *o*, of steel is fixed; through both of which the slit before mentioned is made for the florentine to pass. Another thin tube of steel (which is the cutter *p*,) fitting closely within *o*, is made to slide up and down with a spiral spring coiled round it as *q*, *q*, bearing against a shoulder at top, by which means the cutter *p*, is kept up. Within this cutter a cylindrical punch *r*, is fitted, and is also kept up by a strong spiral spring *s*.

These are the situations of the parts of the cutter previous to the piece of florentine being cut out; it will now be perceived that by the descent of the upper punch box C, the pin *n*, will be brought down upon the top of the punch *r*, forcing it, and the cutter *p*, through the florentine, the steel tubes *o*, and *p*, acting together as shears.

The disc of florentine having being thus cut out, the further descent of the cutter p, and punch r, carries the disc to the bottom of the tube o, below which one of the chambered rings in the wheel N, is situated. The cutter having been thus passed to the bottom of the tube, is stopped there by the shoulder p, at its top, coming in contact with the top of the outer cylinder, but the punch r, being supported by the spring s, is allowed to pass a little further, by which means the disc of florentine is carried out of the tube, and deposited in the chambered ring below.

Having cut the first disc of florentine from the corner of the piece spread upon the feeding board, the other discs in the range are cut out in the same way; the carriage being shifted in a lateral direction, after the rising of the cutter at every rotation of the main shaft, by the following means:—

Near the extremities of the main shaft A, there are cams W, W, acting on the sliders Z, Z, as shewn in fig. 3,— by means of which the sliders are made to ascend and descend at every rotation of the main shaft.

To the lower extremities of these sliders right angled levers, a, a, are attached by joints, and to the longer arms of the right angled levers, palls b, b, are connected also by joints, which palls take into two horizontal ratchets c, d, fixed to the sliding frame carriage X, X, and which are most evidently shewn in the back view of the machine fig. 2. It will now be seen that by the rotation of the main shaft, the cams W, W, raise and depress the sliders Z, Z, and the sliders as they ascend and descend cause the right angled levers a, a, to vibrate upon their fulcrum pins, and consequently to slide the palls b, b, to and fro.

Now there is a contrivance that will be explained below, by which one of the palls will be lifted up out of the

ratchet, while the point of the other palls is lowered into the teeth of the ratchet, consequently only one of the palls will be in action at one time. It will be seen in the said back view, fig. 2, that the pall at the left hand is the one which is in operation, and that by the vibrating action of the right angled lever, the point of the pall has been made to move the sliding frame X, by a series of strokes a tooth at a time.

The carriage with the florentine having, by the successive movements before described, reached its greatest extent to the left hand, one of the arms *z*, stands exactly over one of the small levers *a**, and in this situation the next descent of the punch box c, causes the lever *a**, to raise the arm *z*, which withdraws a catch *b**, from the back of the upper feeding chap *e*, and allows that chap to be thrown back with its frame, by the force of a spring *c**, as shewn in the auxiliary fig. 4. The distance to which this chap recedes must be regulated by a screw *d**, according to the breadth of the required disc.

The edges of the feeding chaps are furnished with fine points standing in inclined positions, as shewn in the sectional figs. 5, 5, 5, for the purpose of taking hold of the florentine. In order to bring forward the florentine for a new range, the chap *e*, which has fallen back, must be again brought up, as at fig. 3, which is done at the first return of the carriage by the small arm *e**, at the back of the frame, passing over the inclined plane *f**, placed in the middle of the back of the machine, as shewn about to take place in the detached fig. 11, and the upper chap being thus thrown up to its former position, is there again held by the catch *b**.

I have described the whole of the process of and all the parts of the machine suited to the making of covered buttons, but I also make in the same machine metal

buttons of the kind called shell buttons. It is necessary to observe that in the manufacture of shell buttons formed entirely of metal, there will require no other alteration in the machine than the omission of those parts which have been described as applying to the feeding and conducting of the florentine.—[*Inrolled in the Roll's Chapel Office, June*, 1828.]

Specification drawn by Mr. Newton.

To Isaac Dickson, *of Chester Street, Grosvenor Place, in the county of Middlesex, Esq. in consequence of a Communication made to him by a certain Foreigner residing abroad, and Discoveries by himself, for an improved Projectile.*—[Sealed 8th Dec. 1828.]

The subject of this Patent is a walking stick gun;—with deference to the learned gentleman who devised the above title, not a *projectile*—but a *projector*. This description of gun is not altogether new, as may be seen by reference to the Patent of Mr. James Cook, of Birmingham, dated 20th May, 1824 (see the First Series of our Journal, Vol. IX, p. 297); but the peculiar features of novelty herein claimed will appear by the declaration of the Patentee, in the following

SPECIFICATION.

I the said Isaac Dickson, do hereby describe the nature of the said invention to consist in a gun or fowling piece, the lock, touch hole, and breech of which slide by means of a telescope movement into the stock, which is made to assume an angular position for the shoulder, or rectilinear position with the barrel, at pleasure, for that purpose, and which said improvement is more particularly applicable to

that which is commonly called a cane or walking stick gun. And in further compliance with the said proviso, I the said Isaac Dickson do hereby describe the manner in which the said invention is to be performed by the following description thereof, reference being had to the drawing annexed, and to the figures and letters marked thereon; that is to say—

Description of the Drawing—See Plate VII.

Fig. 1, is a section of the said invention, showing the improvement as applied to a cane or walking stick gun; A, is the barrel; B, the breech, which it will be observed has the touch hole at the end, instead of at the side, and is made to receive a copper cap; C, is the hammer, acted upon by the spiral spring D; the piece of steel forming the hammer is coloured blue, which at once shows its shape, and it will be seen that at the end E, of the hammer is a small catch or notch, which takes in to a corresponding catch or notch at F, which is the trigger formed of two parts, F, and G; the part F, is hung on a pivot, and is supported in its proper position by the spring H, while the part G, is kept steady by the top spring I, which acts like the spring at the back of a pocket knife; J, is a small spring, to throw out the part G, which would otherwise, under certain circumstances which will be hereafter explained, remain folded up in the hollow space under the part F. All these parts, which constitute the lock, are enclosed in the tube K, K, which it will be seen extends from L, to M, and within which there is another tube N, for the spiral spring to butt against at one end, and supported at the other by the solid end piece O; the dotted parts P, P, show the instrument used to bring the hammer to full cock, there being no half cock required in this invention.

It is hardly necessary, after looking at the drawing, to

state that there are corresponding apertures in the tubes K, and N, and in the hammer at Q, to allow this instrument P, to act. By drawing the instrument P, back in the direction of the arrow, the notch E, on the hammer will be drawn on to the notch F, on the trigger, and the hammer will be at full cock; *a*, is an aperture through which to put the copper cap on; *e*, is an aperture for it to drop through, after the gun has been fired, and *i*, is a boss to hold the screw of the spring that acts from it; R, is a joint piece or strong piece of metal, to form with O, the joint T; and when O, and R, are held in a straight line, as here shown, the whole of the parts hereinbefore described, from U, to V, may be pushed into the tube S, S, which forms the stock in the manner of a telescope joint.

The stock S, S, is composed of two tubes, one within the other, and the inner one has a slot in its upper side, which serves as a guide groove for the piece R, to slide in, and which not being quite cut out at the outer end, serves for a stop as shewn at W. When the pieces R, and O, are not held in a rectilinear position, the stock turns on the joint T, and drops to the angle shown by the dotted lines; the parts coloured pink, which are seen above, below and passing through the piece R, are for the purpose of keeping the stock more steadily at the angle, when once it has dropped to that position, and are as follows:—X, is a strong steel spring, which, when the stock drops to the required angle, leaves the notch on the piece O, which is here shown to be in, and falls into the notch immediately below it, which brings it to rest upon the head of the pin Y, and while in this position the stock cannot be moved from the proper angle it has assumed till the spring push pin Z, is applied against the pin Y, which pushes up the spring X, and the stock may then be again brought into a straight line with the barrel, to allow of its sliding with

the telescope movement into the stock, as before explained; *t*, is a screw passing completely through the piece R, to secure the springs X, and Z.

Fig. 2, is a full length view, on a smaller scale, of a cane gun on the improved plan. This view represents the part K, containing the lock drawn out of the stock S, and the stock dropped to the proper angle for firing from the shoulder; the trigger G, which will be pushed up into the hollow space under F, as before alluded to, by the movement into the stock, when drawn out again, will be thrown into the position here shown by the force of the spring J, which position is just far enough for the finger to get hold of it, and pull it to the proper position for firing, in which second position it is held by the action of the spring I.

Fig. 3, is the ramrod which I propose to use with the said invention when applied as a cane gun, but it is evident many other kinds may be adopted. The one here shown is intended to be kept in the barrel of the gun when not about to be fired; in which case one end of it is made to serve the purpose of a ferrule, which adds to the cane-like appearance of the instrument when the lock touch hole and breech are slid into the stock, as shown at fig. 4, which represents the said invention, when made to assume the form of a cane or walking stick.

Now whereas various cane guns have been heretofore invented, but not with stocks which can be placed at a proper angle for the shoulder when fired, and replaced in a *rectilinear* direction with the barrel when used as a cane or walking stick in manner aforesaid: And whereas no gun or fire arm has ever been made heretofore with the lock, touch hole, and breech inclosed in a tube, having a telescope movement into the stock, as hereinbefore described: And whereas great advantages are derived from the peculiar construction of the invention herein-

before described, as regards the lightness, and consequent portability of it, combined with the convenience of taking aim or sight, when applied to the purposes of a cane or walking stick gun, but more especially as regards the preservation of the lock, touch hole, and breech from the weather, damage, or accidental discharge by the telescope movement; Therefore I do hereby claim as the said invention the sliding movements, in manner of a telescope aforesaid, together with the joint T, and the parts immediately connected with it, by which I am enabled to bring the stock to the proper angle for the shoulder, or to form a rectilineal position with the barrel for the purposes of the telescope movement at pleasure: And such the said inventions being, to the best of my knowledge and belief, entirely new, &c. &c.—[*Inrolled in the Inrolment Office in Chancery, Feb.* 1829.]

Specification drawn by Mr. Rotch.

To James Whitaker, *of Wardle, near Rochdale, in the County of Lancaster, Manufacturer, for his Invention of certain Improvements in Machines or Machinery for piecing Cardings from Woollen or Cotton Carding Engines, and for drawing, slubbing, and spinning Wool and Cotton.*—[Sealed 24th April, 1827.]

SPECIFICATION.

Before describing the nature of my invention, it may be well to state the advantages to be derived by the adoption thereof.

In the manufacture of wool for the purpose of making flannels and similar goods, and also in the manufacture of

cotton for the coarser description of calicoes, it is usual to subject the raw material to the action of the well known machine called a carding engine; which machine delivers the carded wool or cotton from its front or delivering roller in lengths or pieces, generally from about twenty to sixty inches long, which pieces are called cardings. In the manufacture of woollen these cardings are taken from the engine by children, or persons called piecers, and being placed successively in a frame usually called the billy, are partially elongated and spun or twisted into a coarse thread, called a slubbing. While this process is going forward, it is the business of the piecer to piece or connect together these several cardings as they are consumed or converted into slubbings by the action of the billy. This piecing is effected by placing the two cardings endwise together, and rolling or rubbing them by hand, so that their respective fibres interlace and adhere to each other.

To obviate the necessity of this operation of piecing by hand is one of the advantages of my invention. The woollen cardings already described, being converted into slubbing by the action of the billy frame, are transferred to the mule where they are further elongated by drawing rollers, and spun or twisted into fine yarn for the purpose of either warp or weft, to be afterwards woven into flannels or other similar fabric.

Now having formed my cardings into one continuous length by the action of my piecing machinery hereafter to be described, the other essential improvement of which my invention consists, is the transferring of such carding direct from the piecing machine to the mule and subjecting them to the action of drawing roller, without the intervention of the billy, or their being converted into slubbings; by drawing the cardings by means of drawing rollers before they receive much twist, and spinningthem into either warp or weft fit for the loom at once; thereby shortening the process and lessening the expense.

Having described the nature of the advantages to be gained by my certain improvements in machines or machinery for piecing

cardings from woollen or cotton carding engines, and for drawing, slubbing and spinning wool or cotton. I shall proceed to describe the apparatus by which the operations of piecing the cardings is effected.

Plate VII, fig. 5, is a front view; fig. 6, a transverse section.

This machine is adapted to piecing four rows of carding, but by similar arrangements any number may be pieced at the same time; A, is the front or delivering roller of the carding engine, and the carding in its progress from the said delivering roller may be seen at *a, a.* This point is the commencement of my new apparatus for piecing; B. is a smaller cylinder laying parrallel to the delivering roller, for the purpose of receiving the cardings as they are successively delivered by the large cylinder A. This smaller cylinder is acted on by a wheel, having a portion of teeth only sufficient to give it one half a revolution for every carding which it receives from the cylinder A; *b, b,* are longitudinal turned faces, and which from the peculiar construction and arrangement of the receptacle B, are detained and held stationary in the same position during the delivery of the carding from the front or delivering roller A, so that from the rotatory motion communicated to the carding by A, it is placed perfectly straight on the face *b, b,* before it is delivered to the second receptacle F, on to which the cardings are received or delivered by the engine; C, is a lever weighted at D, and pressing on two pins or studs, placed at the end of the cylinder B; these studs and the lever, are for the purpose of holding the cylinder B, in the exact position, for receiving the carding on the respective faces *b, b,* at every half revolution imparted to it by the teeth of the wheel E. By the action of the cylinder B, the cardings are successively conveyed from the delivering roller A, and placed on the face of a second receiver F, where the carding may be seen. This receptacle F, makes uniform half revolutions similar to the cylinder B, and is acted on in like manner by the lever G,

and weight H, having studs at its extremity similar to B. From the position as seen at F, the cardings are allowed to fall in succession by the half revolution of F, on to the face of that portion of the machine which revolves on the shaft I.

The construction of this part of the machine will be more clearly seen by reference to the section, fig. 6, where the respective faces for receiving the carding as delivered from F, will be seen at *i*, *i*, *i*, *i*; these faces are caused to revolve in the direction of the arrow, and the cardings, as they are respectively deposited on the faces *i*, *i*, *i*, *i*, roll or slide down by their own weight into the angles *k*, *k*, *k*, *k*. These angle pieces are constructed to move freely on the axis on which they are placed and balanced, so as to fall forward and deliver their respective cardings uniformly at one point of their revolution round the shaft I.

These periods of delivery are so arranged as to drop or deposit the cardings into the successive angle boxes or receptacles K, L, M. and N, where again they roll by their own weight or gravity into the lowest angle.

Attached to the shaft I, will be seen a projecting piece or lever O, which at every revolution acts on the point P, and opens the box or receptacle M. The point P, is connected by the rods and levers P, to the diagonal or moveable sides of the boxes K, L, and N, which vibrate on their respective centres; consequently as soon as the respective faces *i*, *i*, *i*, *i*, shall have deposited a carding each into the boxes or receptacle K, L, M, and N, by performing one revolution, the lever O, striking against the point P, opens the boxes, and drops the cardings on to a continuous webb or cloth hereafter to be described, in the position as seen at *l*, *l*, *l*, *l*, fig. 6.

As soon as the lever O, has passed the point P, the weight Q, acting on the rods, and the lever P, immediately closes the boxes or receptacles K, L, M, and N, and leaves them in a situation successively to receive the carding in the box N, M, L, and K.

Having traced the progress of the carding from the delivering roller of the carding engine as far as *l*, *l*, *l*, *l*, where it is deposited in four rows on the continuous webb of cloth, the Patentee proceeds to describe certain variations, which may be made in the construction of the receiver B, by which the cardings are conducted from the cylinder H; but these variations being unimportant, we pass them over.

C, fig. 6, is an arrangement of four revolving brushes, having a rotatory motion communicated to them, and coming within a very small distance of the angle pieces *k*, *k*, *k*, *k*, during their revolution round their centre I. If by any irregularity of the machine two or more cardings should come together on the faces *i*, *i*, *i*, *i*, or from any other cause a carding should lay irregular, or project over the angle piece, so as not to be perfectly straight, which is essential to making good work, then these revolving brushes take hold and remove it entirely out of the way.

In fig. 5, will be seen the direction and course of the continuous web of cloth R, on to which the cardings are successively placed in the manner hereinbefore described. This endless cloth passing round the pullies S, is continued over the drum or cylinder T, which has occasional motion imparted to it through the wheel U, by the bevel gear which has only teeth sufficient to move the continuous cloth R, through a space not quite equal to the length of the cardings deposited on it at *l*.

The continuous web R, having received sufficient motion from the bevel wheel to bring forward the end of the carding first deposited as far as the point V, another succession of cardings are in like manner deposited thereon, from the boxes K, L, M, and N, which cardings touch and overlap in a small degree, those which were last removed in the direction V. The succeeding motion imparted to the continuous cloth R, by the segment of the bevel U, carries forward the cardings towards the cylinder T, whence they pass over the cylinder W, and under its presser X, and are finally deposited in the cans Y, which receives a slow rotatory motion by means of a band, thereby

placing the carding in a coiled and uniform arrangement, in which state it is either transferred to the billy to be converted into slubbings, or as I recommended, to the drawing rollers of the mule where it is stretched or elongated, and converted into warp or weft, as circumstances may require.

At the opposite side of the machine to that shewn in fig. 5, there is an eccentric for traversing back and forth the piece V, which moves freely; immediately below the piece V, will be seen a stretched surface of cloth, or other flexible material *v*, and below is a presser of wood *c*, covered with cloth, or other similar substance placed beneath the upper surface of the cloth or endless webb R, and extending its whole width; this presser is permanently fixed on the levers D, which move on their falcrums E, and are counterbalanced. As soon as the cardings which have been so placed on the endless webb, as to overlap or touch each other endwise, shall be brought immediately under the face V, by the occasional motion of the endless webb R, the presser C, is raised by the action of a tappet or eccentric, which moves on their fulcrum and thereby raising the levers D, to which they are connected by the rod *h*. The carding thus pressed by c, against the surface V, which is at the same time receiving the alternate back and forth motion from the eccentric, are rubbed and pieced or joined together in a similar manner to the ordinary method of piecing by hand, and formed into the continuous carding, which is carried forward by the endless web R, and deposited in the cans Y, Y, &c. as already described.

The cans Y, being filled with continuous cardings, are removed to the billy, where they are converted into slubbings, or as I recommend particularly when designed for wefts to the mule, where it is passed in the state of a continuous carding through the additional roller, as represented. The rollers are speeded according to the nature of the wool to be manufactured, which speed can be varied; but the arrangements shewn in the figures have been found to answer, and it is this arrangement, and the discovery that such cardings were susceptible of being drawn and elongated by drawing rollers, together with

the proper arrangement of such drawing rollers, that constitute the second and essential part of my invention of "certain improvements in machines or machinery for piecing cardings from woollen or cotton carding engines, and for drawing, slubbing and spinning wool and cotton."

Having now described the various combinations of machinery, and the manner in which I effect my improvements in machines or machinery for piecing cardings from woollen or cotton carding engines, and for drawing, slubbing and spinning wool and cotton, it must moreover clearly be understood that in the construction of the various apparatus which constitute my invention, the proportions of the parts may be varied, and that various minor particulars as to the size of such parts are considered perfectly attainable by any workmen reasonably acquainted with mechanical operations; and although I do not claim entire novelty in the mechanical piecing of cardings, I do claim the novelty of the construction and property of the part B, which, as hereinbefore described, stretches and holds the cardings in the proper state to deliver them uniformly and successively to the receiver F; and as the entire novelty of the part B, along with the general arrangements hereinbefore described, and as the forms or parts of the said machinery admit of many modifications, all capable of producing the same effect, and may be constructed with belts and pullies instead of wheels, with parts differently arranged or of different magnitude, with parts introduced to change the direction of the motion, or with parts differently proportioned so as to require the application of the generating motion to other parts of the apparatus than which I have applied it, I do claim such modifications of the forms or parts of machinery, as applied to machines or machinery for piecing cardings from woollen or cotton carding engines, and for drawing slubbing, and spinning wool or cotton.—[*Inrolled in the Inrolment Office in Chancery, June*, 1827.]

Specification drawn by Mr. Nicholson.

To PHILLIP JACOB HEISCH, *of America Square, in the City of London, Merchant, in consequence of a Communication made to him by a certain Foreigner residing abroad for certain improved Machinery for spinning Cotton.*—Sealed 20th February, 1827.]

THE improvement herein proposed is a certain construction of mechanism intended to be adapted to a well known machine called a roving frame, in which the fibres of cotton undergo the first operation of spinning, that is, being formed into a loosely twisted yarn, or as it is technichally called a roving.

The object of this contrivance is to cause the bobbin on which the yarn is to be wound to turn slowly upon its axis, placed in a horizontal position, for the purpose of taking up or winding on the yarn progressively as it becomes spun or twisted, by the rapid rotation of the bobbin on the vertical spindle.

The sliver of cotton having been previously prepared in the carding engine, is passed through drawing rollers as usual in other roving frames, for the purpose of elongating it, and bringing its fibres into a thin state. The spinning part of the machine then twists the fibres into a loose cord, which is called the roving; and the method by which this cord is taken up or wound upon its bobbin is the subject of the present patent.

Plate VII. fig. 7, represents the improved apparatus, and shews in what way it is connected with the machine; *a*, are the drawing rollers, placed in the upper part of the machine, from whence the thread of roving is passed down to the bobbin *b*, through the eye *c*, at the upper part of the bobbin carriage *d*, *d*. This carriage is fixed on the top of the spindle *e*. The spindle stands vertically, its lower part bearing in a cup or socket placed in the lower rail *f*, and is supported at its upper part by a collar in the upper rail *g*.

The spindle is turned round rapidly by means of the

beveled wheel *h*, which is driven by a corresponding beveled wheel *i*, fixed on a horizontal shaft, extending the whole length of the roving frame, and which shaft being made to revolve by any convenient means, drives all the spindles placed in a row along the machine in a similar way.

The carriage L, is a frame of wrought iron, consisting of two upright sides, and horizontal cross pieces connecting it together. This carriage is, as above said, fixed to the spindle *e*, and consequently revolves with it. The axis of a cylindrical roller *k*, passes through slits in the sides of the frame, and the axis of the bobbin is confined by the same means.

The periphery of the bobbin *b*, bears upon that of the roller *k*, and the roller *k*, being made to revolve upon its axis, causes the bobbin to revolve also by the friction of contact, and consequently to take up, that is, wind on the roving as it becomes twisted.

The means by which the roller *k*, and the bobbin *b*, are made to turn upon their axis are these: a toothed wheel *l*, is placed loosely upon the top of the spindle, similar wheels being placed upon the tops of all the spindles: these are all connected together by intermediate wheels, and driven by one driving wheel. Or, instead of the toothed wheels *l*, spur wheels may be substituted and driven by an endless chain passing round the whole.

By these contrivances the rim *m*, attached to the wheel *l*, is made to turn with a different velocity to the spindle, and there being toothed wheels *n*, *n*, affixed to the ends of the axle of the roller *k*, which take into a circle of teeth on the upper edge of the rim *m*, with whatever velocity the rim *m*, is driven, so will the roller *k*, and the bobbin *b*, be made to turn upon their axis, and thus the taking up or winding of the yarn on the bobbin is effected.

As the yarn becomes wound upon the bobbin, the diameter of the bobbin increases, and consequently its otation becomes slower, and the taking up is propor-

tioned to the enlarged circumference; the train of actuating wheels being properly adjusted to suit the required speed, which must correspond to the delivery of the material from the drawing rollers.

In order to lay this yarn uniformly along the periphery of the bobbin, a traversing eye or guide piece is introduced connected with the top rim of the carriage at *o*. The roving, in its progress downward, passes through this guide, which is a small arm or lever, turning on an excentric pivot. This arm is moved by means of a tooth or pin fixed to the axis of the bobbin, which pin, as the bobbin revolves, acts as a crank, and strikes against the lower end of a small spring lever *p*, suspended perpendicularly to the side of the carriage. Every time, therefore, that the bobbin revolves, this small spring lever is made to vibrate, and the upper end of the lever acting against a loose ring with ratchet teeth, which carries the aforesaid guide, causes the ring to be progressively moved round, and consequently the guide to traverse, so as to conduct the thread or roving to and fro from end to end of the obbin.

There are some variations and modifications of the above plan proposed, embracing the same principles of action, but considering the great velocity with which spindles require to be turned, the contrivance from its complication can scarcely in any way be found applicable to the object proposed; beside a very similar contrivance for the same purpose, though effected in a much simpler way, formed the subject of a patent granted to Francis Molineux, in May, 1826, the specification of which is given in the XIIth volume of our Journal (First Series), page 281, and Plate XIV. It is therefore questionable whether the present Patent can stand, as it appears to be too close a resemblance to the former, to avoid being considered in some particulars as an infringement.—[*Inrolled, August,* 1827.]

To CHARLES BOSWELL COLES, *late of Duke Street, Manchester Square, in the County of Middlesex, Esq. and* WILLIAM NICHOLSON, *of Manchester, in the County of Lancaster, Civil Engineer, in consequence of a communication made to them by a certain person residing abroad, for a certain invention or new method of constructing gasometers or machines, or apparatus, for holding and distributing gas for the purpose of illumination.* —[Sealed Feb. 20, 1827.]

THE objects of the Patentees are to construct expanding gasometers, capable of holding any quantity of gas which may be placed within them, under any required degree of pressure, and under some circumstances of transporting the gas in its gasometer from place to place, for the supply of small establishments.

The gasometer or gas holder is constructed of any required shape, dimensions or capacity, either of sheet metal or wood, made perfectly secure at the joints, by covering it with painted cloth, or a composition of elastic gum (*caoutchouc*). The containing vessel being constructed in the way described, a moveable partition is placed within it, called a diaphragm ; to this is attached an apron of cloth, leather, or other flexible material ; and the reverse edge of the apron is made fast to a sliding hoop or frame, which fits closely the interior of the gasometer.

The diaphragm is designed to be moved up and down within the gasometer by the pressure of the gas, in the same way that a piston is moved by the pressure of steam ; but the diaphragm is intended to stand stationary at any height, within the vessel, so as to confine any quantity of gas at a given pressure within its proper volume :

as for instance, the gasometer may be one quarter full of gas, one half, three quarters, or any other proportion of the vessel may be occupied, and by the rising or falling of the diaphragm, the gas may be kept at its proper or any required pressure.

In order to counterpoise the weight of the diaphragm, it may be suspended by cords passed over pullies with weights, and being thus suspended, it will be capable of ascending or descending, so as to bear upon the surface of the gas and confine it, however large or small may be the volume contained within the gasometer; and small rollers may be attached to the sides or angles of the diaphragm, to enable it to rise and fall uniformly, without catching against the interior of the gasometer.

The gas may be introduced into this vessel by the ordinary means, through a valve at bottom, and on the diaphragm rising, the air, which occupies the vessel above the diaphragm, will be allowed to escape through an aperture.

These being the principal features of the invention, the minor parts may be variously modified, which the Patentees have anticipated, and therefore claim the application of the moveable diaphragm within a gasometer, for the purpose above described, in whatever way the same may be adapted.

In order to transport the gas from place to place, for the supply of small establishments, a gasometer of this construction is proposed to be placed upon wheels, by surrounding it with a light frame, in which the short axles of the wheels turn, and the gas may be transferred from this portable to a stationary gasometer, by means of a suitable pump, or by pressing down the diaphragm, or in any other way that may be found convenient.—[*Inrolled August*, 1827.]

To Samuel Jones *of the Strand, in the city of Westminster, and county of Middlesex, Artist, in consequence of a communication from a Foreigner residing abroad for a new and improved method of producing instantaneous Light.*—[Sealed 10th December, 1828.]

The subject of this Patent is a little article, lately introduced from America, by which fire is obtained by the article being pressed between the finger and thumb. The use to which this instantaneous ignition was proposed to be applied was the lighting of a candle quickly in the night, sealing a letter, or lighting a segar, or pipe, as the fire continued for about a minute blazing like the flame of a candle.

This article, which may be called a match, was made of a triangular form, about an inch long, and so shaped as to be conveniently held by the finger and thumb while burning; a considerable number of them were contained in a small pocket box, and, whenever a light might be required, it was only necessary to pinch one of these matches between the finger and thumb, when fire would immediately blaze out at the pointed end.

The following is the account given by the Patentee of this invention, and the mode of making the match.

"Into a globule or a small vessel of glass, either of a spherical, cylindrical, conical, eliptical, or angular form, of the size of from one sixteenth part of an inch, to two inches long, and from one thirty second part of an inch in diameter, there should be introduced sulphuric acid, varying in quantity according to the size of the globule or other glass vessel; which, however, is not to be completely filled with the acid; and then the aperture or apertures in the same is, or are to be hermetically sealed

or closed by melting the glass by heating it by the blow pipe, or otherwise, as may be found convenient; so that the admission of the atmospheric air, and the escape of the acid are prevented.

"The bulb or other glass vessel, containing the sulphuric acid, is then to be wholly or partially closed in, or surrounded by oxymuriate or chlorate of potash, compounded or mixed with a combustible material or materials, such as animal fat, camphor, inflammable gums or resins, sulphur, and its inflammable combinations, farrinaceous powders, powder from fungi, woods, bark, or vegetable fibre, and vegetable sugars.

"These combustible materials may be used either as a powder or as a paste, made with mucilage or water, and in any proportions as circumstances may render desirable.

"The proportions of oxymuriate or chlorate of potash, should not be less than one part in two parts of such of the above mentioned combustible materials as may be combined, compounded, or mixed with it.

"The globule or bulb of glass thus prepared should then be inclosed by or attached to paper, wood, cotton, linen, or other combustible material intended to be ignited, and then by the application of a blow or sufficient pressure to break the globule of glass, the acid in the same will be brought into contact with the composition, and instantly take fire and ignite the combustible material with which it may be in contact."—[*Inrolled Feb.* 1829.]

To William Newton, *of Chancery Lane, in the County of Middlesex, Civil Engineer, Draftsman, and Agent for Patents, in consequence of a communication made to him by a Foreigner residing abroad, for an improved Surgical Chain-Bed, with various appendages, designed for useful purposes.*—[Sealed Jan. 15, 1828.]

This improved surgical chain-bed was invented by Monsiers Rouet and Carpentier, of Paris, and communicated to the Patentee. The invention consists of certain arrangements of mechanical parts, which being put together, form an easy chain couch or bed for invalids; the apparatus having various pinions, racks, pullies and levers, and other contrivances for the purpose of allowing parts of the bed or couch to be occasionally raised or lowered, so as to convert it into an arm chair, or to open, raise, or remove certain parts, for the purpose of getting more convenient access to the patient in performing any surgical operation, or assisting the functions of nature, or relieving the patient from the fatigue of remaining long in one posture, by raising or lowering the ends or sides of the bed and shifting parts of it.

Plate VII, fig. 8, exhibits a section, taken longitudinally, of the frame or box, in which the bed is placed. The mattrasses on which the patient is to rest, are proposed to be made in several pieces *a*, *a*, *a*, and above this is to be suspended a sacking or broad sheet *b*, *b*, for the patient to lie upon, which is to be drawn tight by its attachment to lateral and end rails. In the centre of the bed, there is a box and recess *c*, for the purpose of taking off wet or other matters, without disturbing the patient, there being an aperture through the sacking or sheet *b*, and through the central cushion for that purpose.

The head part of the bed may be elevated by means of the pinion *d*, and segment rack *e*, in the side of the frame, and the middle portion may be raised or lowered by the pinion *f*, which is connected to the shaft *g*, and vertical racks *h*, *h*. The foot part of the bed may also be raised by the pinion *i*, connected to the shaft *k*, and perpendicular racks, and the ends of the box are made to fall down upon hinges, for the convenience of getting at the patient more readily when performing surgical operations.

The several parts of this apparatus may be varied as to disposition and construction, by changing the racks and pinions for jointed levers with cords and pullies, which arrangements have been particularly set out by the inventors in numerous figures. But as it is presumed that the general construction and object of the apparatus are rendered evident by the figure above referred to, the minor details are therefore here omitted.—[*Inrolled July*, 1828.]

To Aristides Franklin Mornay, *of Ashburton House, Putney Heath, in the county of Surrey, Esq. in consequence of a communication made to him by a Foreigner residing abroad, and discoveries by himself for an invention of certain improvements in preparing for Smelting, and in smelting Ores and other substances containing certain Metals, or in extracting such Metals from such Ores and substances.*—[Sealed 27th March, 1827.]

The leading features of this invention are first to agitate the ores in a stream of water, in order that the several materials may deposit according to their respective specific gravities; and secondly, to smelt the ores in a blast

furnace instead of a reverberating furnace, as commonly practised.

The washing of the ores is to be performed on a table of about sixteen feet long, and about five feet wide, not stationary, as in the usual mode of performing the operation, but swinging upon pivots suspended from a frame work. The angle of obliquity, at which the table is to be placed, may be varied to suit the washing of different kinds of ores, and this may be done by shifting the situations of the centres of oscilation upon the longitudinal bars which support them at top of the frame work. The table being immersed a little below the surface of a running stream, and submitted to a vibratory action by any convenient power, the ores placed upon the table will be washed and separated, and descending to the lower part according to their specific gravity, will be received in suitable vessels to be taken from thence for the other operations of calsining, &c.

A water wheel, a steam engine, or any other suitable first mover, may be employed to agitate the tube, but the particular construction is not set out by any drawing, as it is stated that the apparatus may be made in various ways to act on the principle described.

The blast furnace for smelting the ore is to be formed internally in the shape of a four sided prism with the twyer hole near the bottom. The furnace being lighted, the ores are to be introduced from above with layers of coke between each layer of ore, and when necessary any of the usual fluxes may be applied.

The process of smelting must vary according to the kind of ore operated upon, of which the specification treats at considerable length; but, as that is a matter well understood, and cannot be a subject of general interest, we consider it sufficient merely to set forth the feature claimed by the Patentee as new.—[*Inrolled Sept.* 1827.]

Novel Inventions.

Fire Escape.

The calamitous consequences which have so frequently and very recently occurred in London from the want of a ready and convenient means of enabling persons to escape from the windows of dwelling houses when the stair case and lower parts of the buildings have been enveloped in flames, render it desirable to communicate to the public every project which may offer any reasonable hope of answering this desirable purpose.

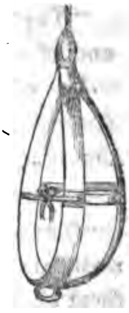
With this view we think it necessary to notice a plan lately proposed by Mr. J. Read, of Regent Circus, Piccadilly, London, (Patentee of the stomach pump), who has adopted an apparatus extremely simple in its construction, and fully adequate to the purpose, if the public could be prevailed upon to keep it in their houses at all times ready. We give it in the words of the inventor, and strongly recommend it to the serious consideration of the public.

"Various inventions of this kind have from time to time been brought before the public, and obtained, each in its turn, an ephemeral popularity. In every instance, however, expectation has been disappointed, no apparatus having been produced which could be made available in all the situations of danger which the emergencies of this calamity occasion. Very little utility can be expected from any complicated means; for, at a time when alarm, precipitation and confusion, prevail, the danger may be increased by an apparatus, the adjustment and operation of which require coolness and mechanical dexterity. To be safe and efficacious, the contrivance should be simple, and one which can be promptly brought

into action and managed by easy and obvious means, even by the timid.

"The proposed apparatus consists merely of a rope, to the end of which is fastened a loop or cradle of strong broad straps of Webb, sufficient to contain two or three persons. An iron ring, having a perpendicular bar crossing it like the tongue of a buckle, is to be screwed into the lintel over the window within the chamber, the rope being coiled in a serpentine form around the bottom of the ring by passing it through the two divisions made by the bar or tongue. Or a strong hook with a security spring, which the inventor has prepared, may be fixed above the window, and this ring hung upon it at the moment of escape. The rope, which must be twice the length of the height of the window from the ground, being properly passed through the ring, coiled up, and placed in a closet or any other convenient situation in the room; upon an alarm of fire, or in time of danger, the ring can be hung upon the hook in an instant. To escape from a window, a person has only to throw the rope (which uncoils itself as it falls) into the street, slip the cradle under him, take hold of the rope outside the window, and sliding out, gradually let himself down, by allowing the rope to pass from one hand to the other. So great is the resistance to the passage of the rope in consequence of the friction against the iron ring, that the weight of a person is but little more than sufficient to bring him to the bottom, and may easily be counter-balanced by *one* hand only. If the person be timid and fearful of trusting to himself, any person in the street may lower him, by taking the rope, and letting it slide as he descends; and in this manner children and females may be speedily and safely let down. In the cradle (which, in addition to the support for the back, has for greater

safety a cross belt fixed to it, that ties in front of the person) a child may be seated by its mother, if no other person be near, who might thus let down all her family and then descend herself in the manner above described. A small line may be tied to the cradle, by which any one in the street might draw the person escaping out of the flames issuing from the lower windows, or pull him clear of any architectural projections, balconies, &c. that might impede his descent."



The inventor has not noticed in the preceding description that he renders his rope incombustible, by having saturated it with a strong alkaline solution, which is a very important feature of security.

We again repeat our recommendation to the public to see this apparatus, and consider its simplicity and trifling cost, aa it may be made by any person after once inspecting it.

Mr. Read is very ready to shew his contrivance, upon personal application, at his house in Regent Circus, and indeed invites the public in the most liberal way to inspect it, and is ready to give every information upon the subject; but we believe declines making and vending the apparatus as an article of trade, leaving it to every person to make for themselves, or obtain it in any way that they may think proper.

AMERICAN PATENTS.

For an improvement in the mode of fitting the hammer heads of piano fortes; John Mackay, Boston, Mass. August 14.

The Patentee says, "my invention consists in letting into the top of the hammer heads, a piece of lead, pewter, solder, zinc, tin, iron, composition of metals, or compound of metals."

"The advantages resulting from said invention and improvement, are as follows, to wit; the hammer head having any of these kinds or composition of metals inserted in the tops of the hammer heads, and then covered with leather, or any other covering, produces, when struck against the strings, a much stronger, fuller and firmer tone than that produced by the the common mode of hammers."

For an hydraulic apparatus for propelling boats or other vessels; Benjamin Phillips, Southwark, Philadelphia, August 16.

Numerous contrivances have been made, to cause the valves, or buckets, by which vessels are propelled, to stand vertically, and, sometimes, to move horizontally through the water, under an impression that the oblique direction in which they dip and emerge, produce a great loss of power. Without touching the main question, we may aver, that whilst some of the plans proposed have manifested much ingenuity and science, no one of them has, hitherto, proved in practice, equal to the ordinary wheel.

The plan of the present Patentee is, to hang hinged buckets along the sides, or in a well, or between twin boats; a reciprocating motion being given to the slide to which they are attached; when moving towards the stern, they are to open out perpendicularly, when towards the bows, they are to collapse. The following is extracted from the specification:—

"These valve buckets shut and open as they meet resistance from the column of water, forming right angles with the resistance, or centre, or parallel lines, when drawn forwards, with the middle of the vessel, offering no resistance, or partially so. These valves or buckets are moved on the longitudinal shaft, in like manner as the frame of an umbrella, or parasol, is opened, or hoisted upon the stick; or, in other words, act on the same principle as the valves in a pump box, and may be constructed in a well, or cylinder, of wood, or metal," &c.

In the drawing accompanying the specification, the structure of the several valves, or buckets, is shown; they, in general, bear a strong resemblance to the *duck foot* valve, which is known to those conversant with the subject; the manner of working the valves is well expressed by comparing it with the 'opening and closing of an umbrella,' as there are tubes sliding upon a bar, with an arm, or stretcher, from them to the valve or bucket, with stops upon the bar, to regulate the angle to which they shall open and close.

For an improvement in raising water from wells, cisterns, and springs, for domestic purposes; Samuel Smith, Mendon, Monroe County, New York, August 20.

This resembles a pump, with a solid piston. The chamber or reservoir, is to be fixed in any place where water is wanted; a pipe, with a valve at top, leads down into the well or spring. In the description, no proportions are mentioned; in the drawing, the chamber has ten times the diameter of the suction pipe, and, of course, the water must pass through this with 100 times the velocity with which the piston ascends. To draw off the water, a cock is inserted through the lower part of the chamber; as the water is discharged, the weight of the piston, and the pressure of the atmosphere, will cause the piston to descend, and occupy its place.

The most curious part of the structure, is the mode of working the pump. The piston rod is a toothed rack, into which a pinion works. This pinion is on the same axis with a wheel of three times its diameter, and this wheel is turned by a crank an the axis of a second pinion, which is about the size of the first; the piston will, of course, rise very slowly; this is evidently intended to accomplish the labour of filling the large chamber, which is to act as a reservoir; but why a single small pinion and crank were not preferred, we do not perceive.

The water is not to be raised by alternate strokes of the piston, but by a single lifting operation, which is to be repeated, when the cistern or chamber is exhausted.

FOREIGN SPIES IN OUR MANUFACTORIES.

We have hitherto felt little apprehension of injury or cause of alarm at the facilities with which foreign travellers have gained access to our manufactories, and the courteous manner in which every process and operation has been explained to them, because we are fully aware that whatever may be the talents of an occasional visitor, it is not possible to carry away in the recollection all the details of complicated machinery, or to become acquainted by a transcient visit with the minutiæ of any important operation; beside, every machine of consequence is introduced on the continent by the inventor himself under the expectation of gain. But, when we discover a systemized plan dictated and supported by the French government, and a number of persons employed here for the express purpose of collecting every species of information connected with the manufactories of this country, we think it time to open the eyes of our countrymen, and to call upon them to consider how far it is prudent or even rational, while they

studiously close their doors against every Englishman who is supposed to be capable of understanding the "mystery of a mouse-trap" to receive foreigners with open arms, and to suffer them to become initiated into all the secrets of their factories.

We are led to these remarks by a very curious discussion which we find going on in the French newspapers, as to whether the Minister is authorised to pay out of the public coffers, so large a sum as appears to be appropriated to this service, and out of what fund he shall be allowed to take it. We give a translation of one of the articles alluded to from a French paper.

"The Minister of Commerce mentioned the Commission charged with the duty of reporting upon the manufactures and industry of England. The members of the commission (among whom are M. Andele) the little French gentleman of that name, we presume, whom we have observed so active in Lancashire, are to receive 20,000 frames, as a compensation for their journey, and they are to be allowed a further sum of 30,000 francs for the purchase of merchandize as samples (that is we presume samples of goods and models of the machine by which they are made.

"The paper then proceeds to take a very different view of the matter to that which we entertain, and no doubt to that intended by he French Minister. It says, "This measure excited considerable complaint among commercial people, as it is easy to perceive that the permission of introducing samples opens the way for enormous frauds, which may be injurious to French industry. Is it expedient at such a time as this to give so just a cause of complaint? Besides, where is the necessity of introducing samples of British merchandize? Is it by demand of the commissions of inquiry, and by deliberation of the general council of commerce and manufactures? Or is it only the pleasure and authority of the Minister of commerce?

At all events, the Minister of Finances takes upon himself to be able to compromise suitable responsibility in ordering the agents of the custom-houses to respect the instruction of

M. Saint Crieq to admit these goods. But although this may be done on the personal responsibility of two excellent men, and their guarantee that the power should not be abused, the fact which we reveal to the public is worthy of the attention of the commission of the budget in more than one respect, it is impossible that it should not call for an explanation on the authority given to the agents sent to Great Britain, and on the utility of incurring so great an expense. From whence is it to be paid? There is not any sum allowed in the budget of 1829 for special missions to the interior or abroad. It is even said that the credit asked for last year for this object was entirely refused."

New Patents Sealed in 1829.

To Benjamin Cook, of Birmingham, in the County of Warwick, Brass Founder, for his having invented an improved method of making rollers or cylinders of copper, and other metals or a mixture of metals, for printing calicoes, silks, cloths and other articles.—23d April, 6 months.

To James Wright, of Newcastle-upon-Tyne, Soap-maker, for his new invented improvements in condensing the gas or gases produced by the decomposition of muriate of soda and certain other substances, which improvements may also be applied to other purposes.—28th April, 6 months.

To Peter Pickering, a native of Frodsham, county of Cheshire, and now domiciliated in Dantzig, Prussia, and William Pickering, of Liverpool, in the County of Lancaster, Merchants, for their having invented an engine or machinery, to be worked by means of fluids, gases or

air, on shore or at sea, and which they intend to denominate Pickering's engine.—28th April, 6 months.

To John Davis, of Lemon Street, in the County of Middlesex, Sugar Refiner, in consequence of a communication made to him by a certain foreigner residing abroad, for a certain improvement in the condenser used with the said petitioner's apparatus for boiling sugar in vacuo, for which a Patent was granted to him the 29th day of March, 1828, intituled an improvement in boiling or evaporating solutions of sugar and other liquids.—28th April, 6 months.

To George Wm. Lee, of Bagnio Court, Newgate Street, in the City of London, Merchant, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in machinery for spinning cotton and other fibrous substances.—2d May, 6 months.

To Henry Bock, of Ludgate Hill, in the City of London, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, for improvements on machinery for embroidering or ornamenting cloths, stuffs, and other fabrics.—2d May, 6 months.

To James Dutton, junior, of Wootton-under-Edge, in the County of Gloucester, Clothier, for his having inventeed or found out certain improvements in propelling ships' boats and other vessels or floating bodies by steam or other power.—19th May, 6 months.

NOTICE TO CORRESPONDENTS.

Mr. Bernhard's Specification is unavoidably deferred for the present.

Mr. Dutton's reply to Mr. Rayner is too late for insertion in this Number of the Journal; it shall be considered.

CELESTIAL PHENOMENA, FOR JUNE, 1829.

D.	H.	M.	S.	
1	0	0	0	Clock before the ☉ 3' 35"
1	5	49	0	Ecliptic conj. or ● new moon
4	8	0	0	♂ in conj. with ε in Gemini.
4	12	0	0	☿ in conj. with ε in Gemini.
4	17	0	0	☿ in conj. with ♂ long. 7° in Gemini.
				☿ lat. 1° 49' N. ♀ lat. 1° 4' N. diff. lat. 45'
5	0	0	0	Clock before the ☉ 1' 56"
5	22	0	0	☽ in conj. with 2 α in Cancer.
6	15	0	0	☽ in conj. with ζ in Leo.
6	20	0	0	☽ in conj. with ο in Leo.
7	5	0	0	☽ in conj. with π in Leo.
9	1	23	0	☽ in □ first quarter.
9	4	0	0	☽ in conj. with τ in Leo.
10	0	0	0	Clock before the ☉ 1'
11	9	0	0	☽ in conj. with θ in Virgo.
12	17	0	0	☽ in conj. with κ in Virgo.
13	20	0	0	☿ in conj. with δ in Gemini.
14	8	0	0	☽ in conj. with γ in Libra.
14	16	0	0	☽ in conj. with θ in Libra.
15	0	0	0	Clock before the ☉ 5-10 of a section.
15	8	0	0	☽ in conj. with φ in Oph.
16	18	15	0	Ecliptic opposition, or ○ Full Moon.
17	5	0	0	♀ in conj. with δ in Gemini.
29	7	0	0	☾ in conj. with β in Capri.
20	0	0	0	Clock before the ☉ 1' 4"
20	9	0	0	♀ in conj. with ε in Gemini.
21	6	8	0	☉ enters Cancer.
21	8	0	0	☾ in conj. with θ in Aqua.
22	0	0	0	☿ Stationary.
23	12	57	0	☾ in □ or last quarter.
24	14	0	0	☾ in conj. with ζ in Pisces.
25	0	0	0	☾ Clock before the ☉ 2' 9"
25	5	0	0	☾ in conj. with ο in Piscest
27	6	0	0	♀ in conj. with ρ Gemini.
28	1	0	0	☾ in conj. with 1 δ in Taurus
28	2	0	0	☾ in conj. with 2 δ in Taurus
28	7	0	0	☾ in conj. with α in Taurus.
30	0	0	0	Clock before the ☉ 3' 11"
30	16	45	0	Eliptic conj. or ● new-moon

☽ the waxing moon.—☾ the waning moon.

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR MARCH AND APRIL, 1829.

1829.	Thermo.		Barometer.		Rain in inches.	1829.	Thermo.		Barometer.		Rain in inches
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
APRIL						MAY					
26	50	29	30,05	30,03	,15	11	66	40	30,03	29,90	
27	55	34	29,75	Stat.		12	66	45	29,96	29,94	
28	50	37	29,71	29,40	,076	13	66	37	29,89	Stat.	
29	45	34	29,74	29,60		14	71	36	29,89	Stat.	
30	45	30	29,83	29,83		15	69	40	29,96	29,89	
MAY 1	60	37	29,61	Stat.	,1	16	63	47	30,00	Stat.	
2	63	43	29,64	Stat.	,025	17	66	37	30,06	Stat.	
3	61	43	29,66	29,56		18	67	39	30,05	29,95	
4	63	39	29,86	29,70		19	68	38	29,89	29,88	
5	63	37	29,96	Stat.		20	71	42	29,92	29,86	
6	64	47	29,90	Stat.		21	71	43	30,06	30,01	
7	58	36	29,99	29,30		22	72	37	30,07	30,06	
8	67	39	30,06	Stat.		23	76	37	30,24	Stat.	
9	67	40	30,06	Stat.		24	65	40	30,24	30,11	
10	71	34	30,03	Stat.		25	57	45	30,32	30,26	,145

Edmonton. C. H. ADAMS.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XVI.

[SECOND SERIES.]

Original Comunications.

ART. XII.—ON GAS METERS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—The Patent for gas meters taken out by Mr. Clegg, the inventor, has, or is about to expire, therefore my remarks following cannot injure the Patentee, or his representative, Mr. Crosley, to whom the Patent right appears to have been sold.

The meter is perhaps the most ingenious piece of machinery connected with gas; but in its present state, particularly the small ones, in most cases, are attended with great trouble and uncertainty of measurement; and sometimes with very considerable danger. Wherever there is an accumulation of gas, as in the meter, there is danger. In frosty weather the meter is frozen, and in that state the meter cannot give light. At

times the water evaporates or escapes through the leakages; and at other times it rises, by means of condensation, above the prescribed level. Excess of water creates a loss to the consumer; but, as is too often the case, a diminution of water creates a loss to the manufacturer, rendering the light feeble and uncertain at the same time. If the water indeed falls beyond a certain extent, total darkness is the consequence. No gas can in that case pass through the meter. In short, the attention required to small meters, and the anxiety and trouble they create are incalculable. At a meeting of the consumers of gas, in Hull, and reported in the *Hull Advertiser*, of 23d March, 1827, the real merits of the small gas meters were pretty well exposed. It was then stated that they could not be relied on as a correct measure of the gas consumed. There were not two of them which were found to register alike. Indeed, instances have occurred at Stratford, in the shops of Mr. Rowley, grocer, and of Mr. Norris, chemist, where gas passed through these small meters in 1823, without their registering at all! and there were many instances in that quarter of their registering pretty freely, without giving the corresponding quantity of gas. Mr. Pill, confectioner, in the Mile End Road, for instance, reduced his number of burners, and yet found no diminution in the registering of his meter! There is nothing like speaking to facts. They are worth a thousand vague assertions. On the whole, it would have been for the interest of the gas manufacturers that those *ingenious* machines had never appeared. There are cases where a restraint, if only a moral restraint, on consumers is necessary; but generally speaking, the manufacturer has been a considerable loser by the use of the meters. This is not right. A company, or an individual making a capital, to produce an article of utility, is entitled to a profit—to even *a handsome profit*, for his enterprize and risque. The managers are *gulled*, and their companies are the sufferers. This is not indeed always the case, for there are some managers who have both shrewdness and a sufficient portion of practical knowledge, to stand firmly

between the interest of their company and the importunities and gross flatteries of interested individuals. Such companies continue to divide a good profit, and can afford to give a bonus occasionally. Now to *facts*.

A respectable tradesman, Mr. S. No. 11, Waterloo Place, Edinburgh, used

3 Argands, of 15 holes.
4 Ditto, of 10 holes.
1 Jet, of 3 holes.

The jet was used in the kitchen till eleven or twelve o'clock; one of the four argands at the top of the stair, outside the door, till eleven or twelve; the other three till seven or eight o'clock. The three argands of fifteen holes were used for show rooms and cutting rooms pretty late, say till ten o'clock on an average. By the Edinburgh scale, the price of all these several burners would have been per annum, as follows:—

Three argands, of fifteen holes (none above ten holes are allowed by the scale, at £.4 4s. each), say,	£.12	12	0
1 Ditto, of 10 holes, till 11 o'clock -	5	4	0
3 Ditto, ditto, 8 o'clock - - -	6	0	0
1 Jet, of 3 hours, till eleven o'clock -	3	0	0
	£.26	16	0

This account by the meter from 5th Feb. 1827, to 6th Feb. 1829, was actually as under:—

From 5th Feb. to 9th May, 1827, 2,083 feet of gas, at 12s. per 1,000	£.1	5	0			
From 9th May, to 3rd Nov. 2,507 - - -	1	14	11			
From 3rd Nov. to 6th Feb. 1828, 7,089 - - -	4	11	3			
				£.7	11	2
Lost to the company				£.15	4	10

The gas could not have been more profusely used without

enlarging the holes, than was used by Mr. S. from Feb. 1827, *to Feb.* 1828.

Another case. Messrs. Y. and M. cloth manufacturers, Luckenbooths, Edinburgh, first used four argands, with oil, entirely, which cost them £.18 per ann. They then used four gas argands of ten holes, till eight o'clock, at £.2 each—£.8. After that they obtained a meter, when their rental did not exceed £.4 or £.4 4*s*. Let the losses in these cases be multiplied into the number of customers using meters, and observe the aggregate annual loss to the company! The consumers in Edinburgh are just admirers of the meter. No *wonder*. But the singularity is the actual *encouragement* given by the adoption of the generality of companies themselves! They are told that they save by it—*save by it!* Read the foregoing, and say how that can happen? The consumers are more economical they say; and shut up in good time. Let this be admitted. What does it amount to? In the last mentioned case of the cloth merchants, let it be supposed that they should be opened a quarter of an hour sooner than they did when they burned by the scale. For 235 days at 3¾ feet per hour, this would amount to a saving of about 708 feet.

It is quite clear, that for the sake of show and business, the quantity of light, during the hours of actual business, *could not be bery easily diminished*. But allow for that 1,000 feet; or say, on the whole, 2,000 feet of saving. This at 12*s*. would be £.1 4*s*. to be added to the £.4 4*s*. making the sum of £.5 8*s*. still leaving a loss of £.2 12*s*. annually to the good-natured company. How is this to be made up? They have allowed the consumers to get too wise on this head. Who's fault is that?

W. T.

16th June, 1829.

ART. XIII.—DESCRIPTION OF AN IMPROVED APPARATUS TO ILLUSTRATE THE RADIATION OF LIGHT AND HEAT. COMMUNICATED IN A LETTER TO THE EDITORS. BY KNIGHT SPENCER, ESQ.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—I have experienced great difficulty and lost much time in adjusting the reflectors for showing the radiation and reflection of heat as they are commonly mounted by opticians, which is by sliding them upon a rod which passes through a brass slide, soldered to the back of the reflector, and furnished with a nut and screw to fix them to the rod; and I have seen a lecturer, after 10 or fifteen minutes spent in attempting the adjustment of reflectors mounted in this way, give up the point.

To remedy this inconvenience, I have mounted my reflectors in the way shown by the annexed drawing and description, by which I can at any time adjust them in two or three minutes so accurately as never to fail in my experiments. Should you think this improvement will be acceptable to your readers, it is at your service.

I am, Gentlemen, Your's, &c.

KNIGHT SPENCER.

West Brixton, May, 1829.

REFERENCE TO THE FIGURE.

a, a piece of dry inch deal board, framed twenty-six inches long by eighteen inches wide.

b, upright pieces, with grooves to hold the reflector, twenty-four inches high.

c, a piece of deal board to strengthen the uprights and receive the edge of the reflector, grooved for this purpose.

d, an upright strengthened by a board the same as *c,* and firmly fixed to it exactly in the centre.

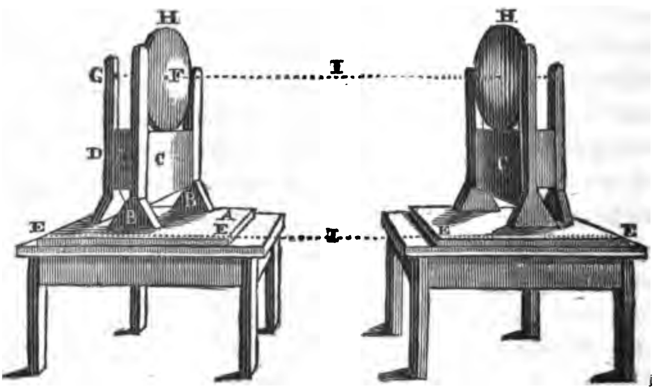
e, notches in the board *a*, exactly one inch from the edge.

f, a small hole in the centre of the reflector, exactly opposite to

g, in the back support or uprights.

h, *h*, reflectors.

i, the dotted lines show the string.



To adjust the reflectors when placed opposite each other, lay a small string from *e*, the back notch of one to the back notch of the other reflector, and when the string cuts or lies over the front notches, the adjustment is compleat.

To find the proper height of the object to be experimented upon, put the string through the holes *f*, in the centre of the reflector, and the holes *g*, in the back uprights, bring the object to it and it will be in its true place; the same adjustment answers for the red hot ball in the opposite reflector.

Lastly.—To find the burning point or focus of the reflectors, measure the diameter (or the chord of arc, as the mathematicians call it), of the reflector. Suppose this to be eighteen inches, then lay a flat ruler over it, and measure the depth of the curve. Suppose this to be three inches—then by the rule of three, say as three inches the depth of the curve is to half the diameter nine inches, so is nine inches to the depth of the remaining arc of the circle; lastly, when found, add this to the

three inches, the depth of the curve as above, and this gives the diameter of the sphere of which the reflector is a segment; the focus or burning point is one fourth of the diameter of this sphere—nearly

Ex, As 3; 9: 9
9

3) 81 (27 inches.
3 inches added as above,

30 inches, one fourth is 7½ inches, the burning point of the reflector from the centre thereof nearly.

NOTICE.

The Select Committee of the House of Commons, appointed to report on the propriety of revising the Laws relating to Patents for Inventions, having closed their sittings, and ordered the Evidence taken to be printed, we consider it desirable to refrain from any further observation on that subject for the present; intending to put our readers in possession of the information elicited by the Committee; after which we shall be open to any further remarks and suggestions connected with that important consideration, and trust that our Correspondents will admit this as an apology for withholding their communications.

Recent Patents.

To Anton Bernhard, *of Finsbury-square, in the county of Middlesex, Engineer, for a method, principle, or apparatus for raising Water or other Fluids.*—[Sealed 24th July, 1828.]

In the second volume of our present Series, page 342, we mentioned this invention for raising water, the specification of which we are now about to lay before our readers, having delayed our report until we were permitted to see the apparatus in action.

Nearly contiguous to the Surrey Canal Bridge, in the Kent Road, about three miles from London, this hydro-pneumatic apparatus is constructed, in a tower of about seventy feet high, to the top of which water is raised by the contrivance about to be described, and which we shall give in the words of the Patentee.

SPECIFICATION.

"My invention consists in a method of raising water and such other fluids as are subject to the same laws, as far as regards the application of this invention thereto, by means of an apparatus acting on the combined principles of exhaustion, atmospheric pressure, heat, and condensation, or refrigeration; and which principles are simultaneously brought into action by a new combination of the air pump, furnace, condensor or refrigerator, and torricellian column.

"The manner in which my said invention is to be performed will be seen by the following description thereof, reference being had to the drawing annexed, and to the figures and letters marked thereon; that is to say, Plate VIII. fig. 1, is a vertical section, through the centre of an apparatus constructed on the principles of my said invention,

and adapted for the raising of water to the height of 50 feet; *a, a,* are supposed to be two sides of an elevated tower, say about 100 feet high; *b, c, d,* and *e,* are four boarded platforms or stories, in the said tower, and some of the other parts merely represent the wooden frame-work which supports part of the apparatus; *f,* is an ordinary furnace; *g,* is the ash pit; *h,* is an ordinary circular boiler, set in the furnace, the flue of which, after passing round the boiler, passes into the brick chimney stack *i,* and is thence carried upwards through the iron funnel *j,* to the brick chamber *k,* whence the smoke is carried off by a smaller branch funnel *o,* which being at the back of this figure, cannot conveniently be shown here; *l,* is a pipe leading from the boiler to the main pipe *m, n,* which is the pipe through which the water is raised in a heated state, and which I therefore call, by way of distinction, the hot fluid ascending pipe.

"It will be observed that this pipe *m,* passes up the centre of the chimney *i, j,* until it reaches the chamber *k,* at which place the chimney and the main pipe take different directions, the latter being turned to one side at *n, n,* in order to pass by the box at *p, p,* which contain a series of small pipes, which I call the condensing or refrigerating pipes.

"The hot fluid ascending pipe *m, n,* communicates with the upper part of these pipes at *q,* as will be more particularly explained hereafter. That portion of the hot fluid ascending pipe, from *q,* to *w,* is separate from the lower part, the point of union being at *w,* where there is a stuffing box, which allows the pipe to adjust itself, as it is extended or contracted in length by the variations of temperature to which it is exposed.

"The vertical part of the pipe *m, n,* which extends below the pipe *l,* is merely for the purpose of support, and to obtain a firm foundation for the whole.

" It will be seen that there is a box at the lower extremity of the pipe, to receive any dirt that may collect, and which box is furnished with a door to remove the said dirt.

" The condensor or refrigerator consists of a series of small pipes, communicating with each other (shown in the horizontal fig. 3, and sidewise at fig. 4), and all enclosed in a strong wooden case, through which a current of cold air passes; the manner in which this current of cold air is admitted into the box or casing, which surrounds the condensing or refrigerating pipes, is not shown in figure 1; but the pipe *u*, is the exit pipe for the air, by which it leaves the box, after having performed the operation of condensing or cooling the water in its passage through the condensing or refrigerating pipes.

" This pipe *u*, should rise about twenty-five feet above the condensor or refrigerator, which communicates at the side opposite to *q*, with the pipe *r*, *r*, *r*, through which the cooled water is carried off, and descends into the cistern *s*; wh refore I call this pipe *r*, for distinction's sake, the cooled fluid descending pipe; *s*, is a cistern kept sufficiently full of water, to seal the end of the pipe *r*; and *t*, is a valve to be applied for the same purpose, when occasion requires; *v*, is an exhausting pipe, leading from the top of the pipe *r*, to an air pump, situated near the cistern *s*, on the first floor *t*, of the building; *j*, is the funnel, or continuation of the chimney, and forms a sort of jacket round the main or hot fluid ascending pipe, which is within it; *x*, *x*, is furnished with a valve opening upwards, to admit water to the boiler, but preventing the return of any water which has once entered. The air pump may be worked by hand or by power, derived from the apparatus itself."

The Patentee here describes an air pipe, which may pass up the building as a blower to cool the refrigerator, and also the construction of the refrigerator itself, which is proposed

to be made of a series of pipes combined and immersed in a vessel of cold water; but as these parts of the apparatus are disclaimed, and any other mode of cooling which may be found convenient, proposed as applicable, it will not be necessary to extend the explanation to the particular construction of those parts. The specification proceeds—

"I will now describe the mode of setting the apparatus to work, and its general action. A constant supply of water, either natural or artificial, must be furnished to the reservoir *y*, so as to keep the water line constantly to the height here shown, or nearly so; water must also be supplied to the cistern *s*, sufficient to fill the pipe *r*, at first setting the apparatus to work, but afterwards enough to fill the cistern to the height here shown, will be sufficient; this being attended to, the air pump should be worked by hand or otherwise; this will of course produce a partial vacuum in the exhausting pipe *v*,—the pipe *r*,—the condensor or refrigerator,—the pipe *m*, *n*,—the branch pipe *l*, —the boiler *h*,—and the feed pipe *x*, *x*; the consequence of which will be that the pressure of the atmosphere on the water in the reservoir *y*, will force a portion of that water through the pipe *x*, *x*, into the boiler, and thence into the main pipe *m*, *n*, up which it will ascend to a certain height, according to the perfection or imperfection of the vacuum created by the air pump, at the same time a similar operation is going on in the pipe *r*, for the valve *t*, being opened, the pressure of the atmosphere on the surface of the water in the cistern *s*, forces a portion of that water up the pipe *r*; and it is important that the vacuum formed should be sufficiently perfect to maintain the water in that pipe at a height of thirty feet at least, and if to the full height of a torricellian column of water, so much the better. But it will be evident that the height of this column will vary according to the specific gravity of the

fluid to be raised, and the length of the pipe *r*, may be made to correspond accordingly.

"We will suppose the water in the main pipe *m, n*, to have risen by the internal exhaustion, and the external pressure of the atmospheric air to the height marked by the dotted lines. If a fire be now lighted in the furnace, and raised to a sufficiently high degree of temperature, the water in the main pipe *m, n*, will become heated, and gradually ascend to *q*, whence it will flow into the pipes of the condensor or refrigerator; in its passage through those pipes it will be cooled by the current of air which will be passing up the pipe *z, z, z*, into the box *p*, and escaping at the pipe *u*; and when the water has been thus cooled, it will flow out of the condensor or refrigerator into the pipe *r*, where it increases the column of water in that pipe to a height greater than the atmospheric pressure below will sustain, and thus a portion of water equal to that which is flowing into the pipe *r*, at its upper end, is constantly flowing out of it at its lower end, into the cistern *s*, to restore the equilibrium; and from this cistern *s*, it is therefore evident a constant fall of water, fifty feet in height from the waste pipe, may be obtained for any purpose required.

"It may be as well here to observe that the height of the said fall of water will always be determined in an apparatus of this kind by the distance between the surface of the water in the reservoir *y*, and that in the cistern *s*. It should also be stated that after a sufficient exhaustion has been made by the air pump to set the apparatus to work, it will still be found necessary to renew the exhaustion by working the air pump, in consequence of the air which disengages itself from the heated water.

"Now whereas various modes of exhaustion may hereafter be found applicable to my said invention, and various

modes of cooling the water, or other the like fluid, by blasts of air, cold water, or otherwise, as it passes from the upper part of the hot fluid ascending pipe to the upper part of the cooled fluid descending pipe. For instance, I will now describe a mode of cooling with cold water, for which purpose the condensor or refrigerator should be inserted in an open iron cistern, instead of a wooden case, as before described, of a sufficient height for the water therein to cover the upper tier of pipes of the refrigerator. A constant supply of cold water must be introduced into the cistern, while an equal quantity is removed from the same, thereby keeping the water at a reduced temperature.

"Now in cases where a constant supply of cold water cannot be procured upon a level with the surface of the water in the cistern, without the aid of mechanical means, the mode described in fig. 2, will be found applicable to advantage.

"A close vessel *a*, (about five feet in length), is fixed to a place where it is always surrounded by cold water, which in this case is the reservoir *y*, being supposed to be constantly supplied with cold water. The pipe *b*, communicates with the vessel *a*, and the cistern *p*. The pipe *c*, communicates with the vessel *a*, and a small cistern *d*, whence it is carried off through the pipe *c*, into the vessel *a*, where it will be sufficiently cooled again, and fit for the use of the refrigerator; and it is evident that the water will ascend through the pipe *b*, into the cistern *p*, the column of water in the pipe *c*, being higher than the column in the pipe *b*.

"It will be observed that the pipe *b*, reaches nearly down to the bottom of the vessel *a*, for the purpose of conveying the coldest water to the cistern *p*, the warmest water remaining always at the upper part of the vessel; for the

same reason the mouth of the pipe *c*, which is but little below the surface of the water in the cistern *d*, removes the warmest water from that cistern, and which is equally the case in the cistern *p*, by the suction pipe of *q*, which reaches but little below the surface of the water in the cistern *p*.

"It will be necessary to fill the vessel *a*, the pipes *b*, and *e*, the cistern *p*, and the cistern *d*, before the apparatus is put to work, and although the same water will be constantly used for cooling the refrigerator, yet it will require from time to time a small addition of fresh water, in consequence of evaporation or other loss of water.

"And whereas also various modes of applying heat to the ascending fluid may be adopted, but I claim as my invention the combination or manner hereinbefore described, of an air exhausting apparatus, which in this case is supposed to be an air pump; a heating apparatus, which in this case is supposed to be a furnace; a cooling apparatus, which in this case is supposed to be effected by a current of air or water; and a torricellian column, which in this case is supposed to be of water; such combination being for the purpose of raising water or such other fluids as are subject to the same laws, as far as regards the application of the invention thereto, either in order to get rid of or remove the said fluid from the place whence it is taken, or to be applied afterwards as a prime mover.

"And such my invention being, to the best of my knowledge and belief, entirely new and never before used, &c. &c."

[*Inrolled in the Inrolment Office in Chancery, January*, 1829.]

Specification drawn by Mr. Rotch.

The experimental exhibition to which we alluded in the commencement of this report, is considered by M. Bernhard as giving but a very imperfect display of the power which he conceives he has under command by the application of his invention; but that having proved his capability of raising water in an exhausted tube to the height of nearly seventy feet, he conceives that he has shown that the generally received notions respecting the nature of fluids, and their expansion by heat, are not referable to his particular arrangement of apparatus.

The theory which we understand M. Bernhard to have formed is this. Having produced a vacuum in the ascending tube or rising main, the water which is supplied from the canal or a reservoir adjoining, rises in that exhausted tube to the height of about thirty-two feet by atmospheric pressure. The lower part of this column of water is now to be heated, which is done by placing a fire under the boiler, the column of water passing through and forming part of the boiler. By thus applying heat, it is presumed that the water in the rising main becomes *expanded sufficiently to cause it to flow up to the top of the tube, more than thirty feet higher than it was at first raised by the pressure of the atmosphere.* From this height it is intended that the water shall continue to flow, and therefore by the application of these principles, it is considered that water may be raised from mines for draining, or for the supply of elevated situations, or as a prime mover.

That considerable volumes of water were from time to time raised during the experiment to the top of the shaft, (nearly seventy feet) and at intervals discharged therefrom, is certainly the fact; but that it was raised by the expansion of the heated column of water, we must take the liberty of saying is at any rate contrary to all established theory, and inconsistent with all previous experiments

tried upon that subject; and we certainly do not consider it possible that such quantities of water as were discharged could have been produced by the condensation of steam at the top of the shaft. As however M. Bernhard has not set forth any theory in his specification, but insists alone on the fact of being able to raise water and other fluids by means of his apparatus, to a height very considerably greater than has heretofore been attainable by ordinary atmospheric pressure, and conceives that the interrupted flow of the water was caused by the imperfection of his apparatus, which if properly constructed, would produce a a continuous stream, we feel it a matter of justice due to Mr. Bernhard, to admit that water has been raised by his apparatus to nearly seventy feet, but upon what principle is for him to point out. We have our own views on the subject, and perhaps when we say that a tube or retort boiler, similar in construction to the refrigerator, was employed, instead of the cylindrical boiler shown in the specification, probably another cause for the water rising and flowing over at intervals may present itself to some of our readers, and the fact may be accounted for upon a different principle to that of the actual expansion of the water.

To Thomas Tyndall, *of Birmingham, in the county of Warwick, Gentleman, in consequence of a communication made to him by a Foreigner residing abroad, for certain improvements in the Machinery to be employed in making Nails, Brads and Screws.*—[Sealed 18th Dec. 1827.]

The subject of this Patent, like that for making buttons, described in our last at page 126, is the invention of Doctor Church, and communicated by him when abroad to the Patentee, resident in England.

The invention may be considered as consisting of two parts; first, the mode of forming nails or brads, and the shafts of screws, by a process of pinching or pressing heated rods of iron or other metal between indented rollers; and, secondly, an apparatus for producing the threads on the shafts of the screws so previously formed.

SPECIFICATION.

These improvements in the machinery to be employed in making nails, brads and screws consist, in the first instance, of a certain combination of mechanical parts, by which rods of metal, in passing between a pair of rollers, are shaped into the approximate figure of the intended nail, brad or screw, and which, after being so formed, are cut asunder between a pair of shears at the ends of the several intended nails, brads or screws; and these pieces are afterwards further pointed and headed, or otherwise brought to their ultimate figure, by means of dies placed in a rotatory cylinder; which several parts of the mechanism are worked by toothed wheels, cams and levers, as will be fully described and exhibited in the accompanying drawings.

The second part of the invention consists of a new arrangement of mechanism, by which the threads of screws may be cut to any degree of obliquity or form—that is, an original screw may be generated or any description of thread copied by a very simple adjustment of the apparatus, as will be explained hereafter.

In the drawing accompanying this specification, Plate IX, fig. 1, is a horizontal representation of a complete machine, as seen on the top side, for forming the nails, brads or screws in the first instance from rods of metal, and afterwards for pointing and heading the same. Fig. 2, is a vertical view of the end of the said machine, drawn geometrically, the fly

wheel being removed; similar letters of reference denoting corresponding parts of the machine in these and the three following figures; *a, a,* is the main shaft, to which the fly wheel *b,* is affixed. A part of the main shaft is divided into a two-leaved pinion *c, c,* which takes into the peculiarly formed teeth of a cog wheel *d, d,* fixed on the shaft *e, e,* and by means of the rotation of this main shaft all the other parts of the machine are put in action.

Fig. 3, is a vertical section, taken through the machine parallel to the end view, fig. 2, in the situation of the dotted line A, A, in fig. 1, in which the forms of the pressing rollers, designed for shaping nails or brads, form the rod of metal, are seen, and also the situation of the dies in the rotatory cylinder for pointing and holding, and the levers for heading the same. It is however to be observed that the rollers and dies exhibited in this figure are designed for forming nails or brads, and would require to be exchanged for rollers and dies slightly differing in shape from these shown, when this machine is to be applied to making the blanks for screws. Fig. 4, is another section, taken vertically, parallel to the preceding, in the situation of the dotted lines B, B, in fig. 1. This figure shows the peculiar form of the cogs, or teeth of the wheel *d,* and the two leaves of the pinion *c, c,* taking into the same, which, as the main shaft *a,* revolves, causes the wheel *d,* to be driven, and consequently the other revolutions of the machine to be performed through the agency of the toothed wheels *f,* and *g*; the former of which is fixed on the shaft of the toothed wheel *d,* and the latter on the shaft of the die cylinder *h*; both these toothed wheels being principally shown by dots in this figure.

Rotatory power being applied in the main shaft of the machine, the rod of metal for making the nails is to be introduced through the guides *i,* and passed between the

rollers *k*, *l*, shown in the section, fig. 3, when the inequalities of the upper roller *k*, will press the rod as it advances into the form of a series of wedges *m*, *m*, each of which is intended to constitute one nail. The foremost end of the rod being by these means protruded forward, it enters the circular groove of the cylinder *h*, which is situated exactly opposite to it, as shown in fig. 1; and as the cylinder revolves, the partially formed nail passes into the die, as in fig. 3, and is there held while it is cut off; the manner of doing which will be further explained.

The detached figure 5, represents a pair of the dies, as seen on the upper side, upon a larger scale. They consist of two pieces of steel *n*, and *o*, cut with rabbetted ends, suited to the form of the intended nail. These dies are mounted in longitudinal grooves, in the revolving cylinder *h*, as seen in fig. 1, the die *n*, being firmly fixed in the groove and the die *o*, allowed to slide freely. A spring, affixed at the end of the cylinder *h*, acts in a notch, at the end of the sliding die *o*, as seen in fig. 1, drawing it back, and consequently opening the dies. This is the position of the dies, shown in the auxiliary fig. 5; and as the cylinder revolves, the nail introduced into the groove, as above described, passes into the dies at the opening *j*.

The movement of the cutters is effected by means of a cam *r*, affixed to the main shaft *a*, as seen in figs. 1, and 2; and as that shaft revolves, the cam *r*, lifts the lever *s*, attached to the shaft *t*, which causes the shaft *t*, to vibrate on its pivots, and to produce the movement of the upper cutter *q*, through the medium of the short lever *u*.

The short lever *u*, turns on a fulcrum pin in the standard affixed to the frame of the machine, as seen at fig. 3; one end of which lever is connected by a joint to the back part of the vibrating shaft *t*, and the reverse end to the sliding

piece *x*, which holds the upper cutter *q*, the lower cutter being securely fixed to the lower part of the standard. The rising of the lever *s*, causes the piece *x*, and the upper cutter *q*, to descend and to cut off or separate the partially formed nail from the rod.

The partially formed nails being thus cut off from the end of the rod, by the cutter *q*, the cylinder being stationary at the time, the next movement of the cylinder carries this nail up to be headed.

As the cylinder revolves, the end of the sliding die *o*, comes against the curved inclined plane *v*, affixed to the side of the standard, seen in figure 1, which causes the die *o*, to be forced inwards; and by thus closing the dies, the nail is moulded into the required form which it is designed to assume, and at the same time it is held securely for the purpose of being headed.

By raising the lever *s*, in the manner before described, the heading block *w*, attached to the shaft *t*, is depressed, which brings the die *x*, on to the top of the nail, and produces the head.

Let it here be observed, that although the main shaft *a*, is to be turned by a uniform motion, yet in order to give time for cutting and heading the nails, the rollers *k*, *l*, and the cylinder *h*, must be made stationary at intervals; this is effected by the peculiar form of the teeth of the wheel *d*, which allows the levers of the pinions *c*, to move through a portion of their revolution, without driving the wheel forward, and which takes place at the time that one of the cams of the wheel *r*, is raising the lever *s*, and the cutting and heading is performed in the way above described.

The further rotation of the cylinder *h*, carries the nail to the opposite situation to which it was introduced into

the cylinder, where a small punch, acted upon by a spring through the medium of a lever *y*, projects it from the dies, as shown in fig. 3.

The tails of these levers *y*, *y*, extend out at the end of the die cylinder, and are, during the revolution of the cylinder, pressed inwards by a snail formed piece *z*, shown in fig. 2; and when the cylinder arrives at that part of its rotation where the nail is to be projected, the end of the then acting lever slips off the smaller to the large diameter of the snail. The action of these levers will be perfectly understood by reference to the auxiliary fig. 6, which shows the die cylinder in section, taken longitudinally.

Having described the method of forming the rod of metal into wedge-shaped pieces, and cutting those pieces asunder, and afterwards heading them, it will be necessary to observe that the rod of metal should be made hot, previous to its introduction between the rollers; this, however, is not absolutely indispensible, as the nail may be made from the rod in a cold state; but heating it will facilitate the operation.

The form of the dies employed for moulding and heading the nail must depend upon the kind of nail intended to be made; the dies are therefore capable of being removed from the cylinder, and headed with facility; when others may be placed in their stead.

In moulding the blanks for screws, both of the rollers must be formed with semicircular grooves, and with suitable recesses for the heads; and when cut asunder, the perfecting of the head is performed by the heading die.

I now proceed to describe the second part of the invention; viz. the method and machinery for cutting threads on screws, which are exhibited in the 7th and following figures

of the drawings. The apparatus resembles a turning lathe in some of its prominent features, of which fig. 7, is a horizontal representation; and fig. 8, a vertical view taken longitudinally; *a*, *a*, is the bed; *b*, *b*, the mandrel frame, supporting a mandrel, rigger and gearing, resembling an ordinary lathe; *c*, is the foot puppet of the usual construction; *d*, a slide rest, held firmly to the bed by the weight *e*.

A peculiar novel feature in this part of the invention is the method of producing a reciprocating motion of the slide rest carrying the cutter, and which contrivance also affords a means of giving the required obliquity to the thread of the screw.

The wheel *f*, being locked to the rigger *g*, by a peculiarly formed bolt (as will be described hereafter), and the rigger made to revolve in the direction of the arrow, the toothed wheel *h*, and the mandrel *i*, to which it is affixed, will be turned in the opposite direction.

At the back end of the mandrel there is a small pinion *k*, which takes into a rack *l*, *l*, affixed to a sliding plate *m*, *m*, shown particularly in the horizontal view. To the plate *m*, a guide box *n*, *n*, is attached, which turning upon a pin, is capable of being adjusted and fixed at any required angle of obliquity; a bar *o*, *o*, attached to the slide rest, is connected to the guide bar *n*, by having a notch on the under side, through which the guide bar slides, as seen in the detached fig. 9.

It will now be perceived, that by turning the rigger in the direction of the arrow, the pinion *k*, will cause the rack bar and the sliding plate to recede, that is, to move in the direction of its arrow, and by this movement the guide bar *n*, standing obliquely, will be made to draw the slide rest, by its connection to the bar *o*, towards the mandrel frame. By these means the cutting tool, as it moves with the slide rest towards the puppet head, generates and cuts a screw thread upon the blank *p*, as shown in fig. 8.

When the thread has been cut sufficiently far upon the blank *p*, the action of the machine is reversed for the purpose of car-

rying the slide rest with the cutter back again, by the following means:—As the plate *m*, slides, a tappet *q*, screwed to the plate, strikes against a tooth at the lower end of the perpendicular shaft *r*, shown most evidently in the auxiliary fig. 10, by which means that shaft is turned round, and a horizontal lever *s*, affixed to the top of the said shaft *r*, being connected by a link *t*, to the sliding pin *u*, that pin is forced inwards, and a locking bolt *w*, the arm of which is connected to the pin by passing through a mortice hole, is by the sliding of the pin withdrawn from the wheel *f*, and projected into the wheel *x*; by these means the rigger is now locked to the back train of toothed wheels, as shown in the section, fig. 11; and the mandrel is now made to turn the reverse way.

This movement of the pin is promoted by the logger head above falling over, as shown by the dotted lines in fig. 8. The reverse action being thus obtained, when the slide rest, with the cutter and the sliding plate with its rack has ran back to its extent, another tappet *y*, screwed upon the sliding plate will be brought against the before mentioned tooth at the lower part of the perpendicular shaft *r*, and turn it the reverse way to that above described, which again locks the front wheel *s*, to the rigger.

Previous to the returning movement of the slide rest, it is necessary that the point of the cutter should be withdrawn from the screw; this is done by the action of the before mentioned perpendicular shaft *r*, as will be described. The cutter is attached to the vertical arm of an elbow lever, shown in the auxiliary fig. 12, which lever 1, vibrates upon centres 2, and the rising of the end of the horizontal arm of the lever, causes the cutter 3, to fall back from the screw 4. In the horizontal representation of the machine, shown at fig. 7, there is a sliding bar *z*, attached by a joint to an arm extending from the perpendicular shaft *r*, before mentioned, consequently the action of this shaft is reversing the motion of the slide rest, as described above, causes the bar *z*, to be

slidden to and fro. Upon this bar there are two small tappets 5, 5, capable of being adjusted to any required distance apart, which tappets, as the bar slides, strike against a pallet 6, on the shaft 7. Attached to this shaft there is a small forked lever 8, carrying the pin *q*, which passes through a horizontal slot in the tail of the lever 1. When the cutter is in action, the lever 8, is nearly in a perpendicular position, and is held there by a lever with a logger head 10, seen also in figs. 7 and 8 ; but on pushing back the bar *z*, for the purpose of withdrawing the cutter from the screw, the tappet 5, strikes the pallet 6, and throws the shaft 7, with the logger head 10, and the forked lever 8, in the opposite position ; by means of which the pin 9, sliding in the slot, raises the tail of the lever 1, and throws back the cutter. When the slide rest has moved back to its extent, for the purpose of repeating the cut, the action of the perpendicular shaft *r*, as above described, draws the bar *z*, to the left, when the other tappet 5, strikes the pallet 6, and throwing over the logger head as before, brings the cutter again into action, when it is firmly held by the pin of the forked lever, as explained before.

In order to increase the depth of the cut, a ratchet wheel 11, in figs. 7 and 8, is affixed to the screw of the slide rest, which ratchet wheel coming in contact with a stationary pall 12, at every return of the slide rest, sets up the screw a small portion of a revolution.

To prevent the point of the cutter being broken when it is withdrawn from the work, the tappet on the plate *m*, is made to advance, by very small degrees, at every successive cut, so as to stop the action of the cutter a little earlier every time. The method of doing this is shown in fig. 7, and in the enlarged representation of the tappet fig. 13, the upper plate being removed in this figure to exhibit the parts within.

There is a small lever 13, to which a pall 14, is attached, and this pall is pressed into the ratchet 15, by a spring. Now it will be perceived that by pressing in the tail of the lever 13,

which takes place by its striking again the frame work on every advance of the sliding plate, that the ratchet will be pushed one tooth forward, the tappet by that means becoming elongated, and consequently the distance between that and the other tappet shortened.

This machine is designed for generating and cutting original screws with threads of any required obliquity and figure, and is therefore particularly applicable to the cutting of screw taps, one of which is represented in fig. 8, as under operation; it is also applicable to the cutting of screws for other purposes.

[*Inrolled in the Roll's Chapel Office, June,* 1828.]

Specification drawn by Mr. Newton.

To ROBERT VAZIE, *of York-square, in the parish of Saint Pancras, in the county of Middlesex, Civil Engineer, for his invention of improvements in certain processes, utensils, apparatus, machinery, and operations, applicable to the preparing, extracting, and preserving various articles of Food, the component parts of which utensils, apparatus and machinery are of different dimensions proportionate to the different uses in which they are employed, and may be separately applied in preparing, extracting, and preserving Food, and in other useful purposes.*—[Sealed 12th July, 1827.]

THE subjects comprehended under this Patent form rather a singular association. They are, it is true, all designed for the preservation and preparation of food; but we do not remember to have ever before met with such a combination of subjects as an improved wheat stack, a thrashing machine, a corn mill, and a steam kettle, all within the

pale of one Patent right. Such however appears to be the case by the specification before us, in which the Patentee divides his invention into four heads; first, a "Corn Preserver," which is an improved method of stacking wheat; second, a "Corn Extractor," a thrashing machine; third, a "Conical Corn Mill," a portable steel mill; and, fourthly, a "Steam Stove," or rather a steam kettle. The Patentee describes them as follows:—

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The Corn Preserver.—See Plate X, fig. 8.

"A stake of proportionate length to the height of the sheaves of corn or pulse to be preserved, is pointed at each end; the thicker end is driven into the ground about six inches (as shown by dots;) there is then placed around the stake eight sheaves of the usual size, more or less. A hood sheaf of nearly double the dimensions of the upright sheaves, is bound tight near to the straw end of the sheaf; it is then inverted, placed on the stake by which it is supported, and spread around the upper part of the upright sheaves; in this state the corn may remain until it is sufficiently dry to be stacked or housed.

"This improvement, in which every individual in the country is interested, consists in preventing the injury which corn and pulse too frequently sustain by rain and wind during harvest.

The Corn Extractor.—This machine is shown in the side view, fig. 9.

"A frame of wood *a, a,* is formed four feet six inches in length and three feet six inches in breadth (inside measure,) by three feet six inches in height. A plate *b,* three feet six inches in length by two feet in depth, in the form of a segment of a circle, is placed within the frame in a proper position, to correspond with the action of a

skeleton wheel *c*, which is gently turned round by manual labour within the concave of the said plate; this wheel *c*, is three feet five inches in length by three feet in diameter, the arms *d*, of the wheel stand obliquely, yet parallel to each other.

"At the distance of twelve inches behind this wheel, there is placed a frame *e*, to support another wheel *f*, of twenty inches in diameter; upon this wheel a sheaf of corn *g*, is suspended by the straw end, during the operation of extracting the corn therefrom.

"The advantages attending this process are reduction of manual labour, and preserving the straw uninjured; and in extracting the grain without bruising it, which in the cases of seed and corn to be stored, is a valuable consideration.

The Conical Corn Mill.—See fig. 10.

"A frame of metal *a*, *a*, is formed thirteen inches square, inside measure, by three feet six inches in height, with a bottom frame to rest upon; within the upper rail of this frame there is placed a hollow cone of steel or other metal *b*, twelve inches diameter at the top, and one inch diameter at the bottom, inside measure, by nine inches in depth; within this cone there is placed an interior cone *c*, of like metal: these cones are grooved transversely from each other. In the centre of the top of the interior cone there is fixed a spindle *d*, whereby the cone is turned round through the medium of cog wheels, by a handle attached thereto.

"The whole of the above dimensions may be more or less, as circumstances shall require. The improvement in this case consists in a reduction of manual labour, and in preserving the meal and flour from being heated during the process.

" These cones may be enlarged to require the aid of horses, water, or steam.

The Steam Stove.—See the section of the kettle, fig. 11.

" There is formed a boiler of iron or other metal, of any required form or size, in which there is placed a vessel or stove *a a*, of silver plate or tin, suspended in such a manner as to leave room for the extra steam generated in the boiler *b*, to pass into the upper chamber or space *c*, betwixt the cover of the boiler and the cover of the stove. The process is performed by placing on the fire the boiler containing as much clear water as will rise to about one third part of its height; the stove is then inserted, into which there is put the required quantity of meat cut into slices, with onions, rice, seasonings, bread, and as much cold water as will cover those articles; the stove and boiler are then closed, and the operation commences. In the course of half an hour the water in the exterior vessel will boil, and speedily afterwards the stove will acquire the due heat for preparing animal food, *which it never exceeds.*

" This is the desideratum which the faculty have, with great honour to themselves, frequently attempted to obtain, but heretofore without success. The scum must be removed as it rises. At the expiration of an hour and a half the process will be completed, if the heat in the boiler has been properly supported.

" A good proportion for a stew is one pound of rump steak, and one pound of a leg of mutton cut into slices; put these in the stove, and place thereon two full-grown onions shred small, two table spoonfuls of rice, one dessert spoonful of salt, and one tea spoonful of pepper, together with a slice of bread and the quantity of cold water stated above. This dish I designate an English Stew.

"Joints of meat, fowls, fish, potatoes, or other vegetables, require to be covered with water during the process; steaks may be dressed in butter or other oily substance, and confectionary with sugar. When the operation is performed in an oven, there will be required a cover on the stove, but none on the boiler."

The advantages resulting from this application of heat are as follow:—

First.—The flavour of the food is rendered peculiarly grateful, by the meat being prevented from resting on the bottom of the boiler, which occasions an acrid nauseous taste, and impedes digestion.

Second.—The extra steam passing into the upper chamber, prevents the stove from being charged with more heat than is necessary for the due preparation of the food, accelerates the heat in the stove, and renders the preservation of the juices or essence of animal substances complete: the surplus quantity of that nutritious fluid being infused into the rice and bread contained in the stove, renders them in a great measure as restorative as the meat itself, and thus converts those otherwise passive articles into valuable economical substitutes; even a moderate quantity of meat, with a large portion of potatoes, produces very nourishing food for persons of restricted incomes.

Third.—Any kind of meat usually boiled may be prepared by this process for immediate consumption, or as provisions for a distant voyage, having regard that the lean part of fresh meat is the most nutritious and of the best flavour. By this progress there is a saving of twenty-five per cent. in the consumption of animal food; but even that saving is of small import compared with the invigorating and healthful effect the human frame derives from a full supply of the juice of animals produced in a state of great perfection.

In dressing potatoes alone, unpared, in this stove, the saccarine quality of that valuable root is entirely retained.

Fourth.—This apparatus is preserved in good condition with little labour, and is very durable; the process is *free from danger;* it is simple, pure, and will prove serviceable to persons of all ranks in society; in the mess of regiments, in the navy, in merchant vessels, in hospitals, and in other large establishments.—[*Inrolled in the Petty Bag Office, Jan.* 1828.]

To Anton Bernhard, *of Finsbury Circus, in the county of Middlesex, Engineer, for his having invented certain improvements on or additions to wheels on apparatus for propelling Vessels, and other purposes.*—[Sealed 15th Dec. 1828.]

In the application of this invention the Patentee has adopted that kind of paddle wheel which is constructed with ordinary rectangular float boards or paddles, but suspended upon crank axles, for the purpose of enabling them to turn over, in order that the paddles may enter into the water edgewise, and quit it in the same way, preserving their perpendicular positions during the time of giving the propelling stroke. Paddle wheels upon this sort of construction, that is having their floats suspended upon crank axles, may be seen in several instances in the previous volumes of our Journal, as in Lambert's Specification, Vol. I, First Series, page 341—Oldham's Specification, Vol. XIV, page 1. The particular feature of improvement, however, claimed under this Patent is a contrivance by which the paddles may be made to assume any desired position from the perpendicular, to the horizontal, and to preserve the same

positions during the rotation of the wheel, which the Patentee considers will afford very considerable advantages over any other paddle wheel at present in use, as by changing the positions of the paddles, he will be enabled to take advantage of currents, or under some circumstances, to throw the paddles altogether out of operation, which may be desirable when sailing.

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" I, the said Anton Bernhard, do hereby declare the nature of my said invention to consist in a guide or leading frame, to which each paddle is connected by a crank, and which gives the paddles a direction independent of that which they would otherwise receive from the frame which carries them round; and also in a mode of varying at pleasure the said direction so given as aforesaid.

" Plate X, fig. 1, is a side elevation of a paddle wheel furnished with my said invention; the parts marked *p*, represent eight paddles turning on axes at their centres, and which axes rest on bearings in the frames *f*, *f*, one only of which can be seen in this figure, but which are in fact the frames which carry the paddles round on the main axis *a*; the parts marked *g*, form together a separate frame, which I call the guide or leading frame, revolving also round the main axis *a*, but upon a different centre, which different centre is obtained by means of the eccentric *e*, placed on the main axis *a*; the parts marked *c*, are small cranks firmly fastened at one end to arbors on the ends of the axes of the paddles, and at the other end to the arms of the frame *g*, by means of crank pins, which turn in bearings marked *r*, placed to receive them; *e*, is a circular plate acting as an excentric, and which I therefore call such.—It rests in a steady plate *i*, and the main axis *a*, passes loosely through it. This excentric may be turned round when necessary, but is held steady to the position required when the paddles are in motion, by means of a lever or arm, not shown on the side of the eccentric exhibited in this figure, lest it should

confuse the drawing, but shown at *l*, as fastened to and projecting from the eccentric at the opposite side of the wheel.

"The effect of the guide or leading frame *g*, moving round the eccentric *e*, while the eccentric is held in the position here shown by means of the lever *l*, is to preserve by the action of the cranks *c*, the vertical position of the paddles during the whole revolution of the frame *f*, to which they are attached. But it is obvious that if the lever *l*, be raised or depressed, the eccentric will turn round in the steady plate, and draw with it to one side or other the guide or leading frame *g*, (as shown by dots), causing a corresponding movement in the cranks *c*, that will force them out of the vertical position here shown, and cause them to take any angle required, which angle they will preserve, when the lever *l*, is fixed again with the same uniformity during the revolutions of the frame *f*, that was attributed to the vertical position before described; *b*, is the plummer block, and *d*, the beam to support the main axis *a*, of the paddle wheel.

"Fig. 2, is drawn merely for the purpose of more clearly explaining the relative position of the main axle, which carries round the paddle frame and paddles, and the guide or leading frame, which is acted upon by the cranks; part of this figure is shown in section and part as an elevation, as was thought best for explanation, and only two paddles are represented, lest a greater number should make the drawing confused.

"It will be seen that the apparatus, the side elevation of which is shown in fig. 1, is to be repeated at the opposite side of the machine; but where no great strength is required, it is obvious that one guide or leading frame, and crank at one side of the paddle wheel, will suffice.

"In figure 2, now under description, *a*, is the main axle or shaft; *f*, *f*, *f*, *f*, are two arms of the frame which carries the paddles *p*, *p*, the paddles turning on axes which work in the bearings *s*, *t*, placed on the ends of the arms, *f*, *f*, *f*, *f*, to receive them.

"I have only described such parts of a paddle wheel as have already been used; but I will now proceed to describe the additions thereto, which constitute my said improvements;—they consist of the guide or leading frame *g, g, g, g*, turning round the eccentric *e*, and of the levers *l, l*, which turn the eccentric. It will be seen that the arms of the guide or leading frame *g, g, g, g*, are connected with the axes of the paddles by means of the cranks *c, c, c, c*; and it should be here stated, that the length of the cranks *c*, from the centre of the crank pin to the centre of the paddle axle, should correspond exactly with the distance from the centre of the main axis *a*, to the centre of the guide or leading frame; the two levers are one fastened to each eccentric, and connected at their upper ends by a cross bar, for the purpose of turning the eccentric, and thereby giving any required position to the paddles.

"Now the effect of this arrangement will be, that as the main axis or shaft *a*, is driven round by the steam, or other power applied to it for that purpose, it will of course carry round with it the frame *f, f, f, f*; and the paddles *p, p*; at the same time that the paddles, by means of the cranks *c, c, c, c*, on their axes, will drag round the guide frame *g, g, g, g*, which guide frame turning on the eccentric *e*, and thus having a different centre of motion to the main axis *a*, will cause the paddles to turn on their axes as the frame to which they are attached passes round in such manner as to preserve the vertical position of the paddle through the whole course of its revolution. I state here *vertical position*, because in this figure the levers *l, l*, are supposed to be fixed in the same position as shown, but as stated before; the object of the guide or leading frame, eccentric and cranks, is to preserve the paddles in whatever position may be required, such position to be determined by the position of the eccentric in the steady plate, and of the paddles on their respective axes.

"Figures 4, and 5, are two separate views of the eccentric *e*, and its lever *l*; it will be seen that there is a boss *v*,

cast on the eccentric, which fits into the steady plate *i*, in which it turns; and there is a groove in the boss, to receive two half rings, which keep the eccentric steady in the steady plate.

"Now whereas I claim as my invention, first, the guide or leading frame marked *g*, attached to the cranks marked *c*, and turning round the eccentric marked *e*, for the purpose aforesaid; and, secondly, the lever marked *l*, attached to the said eccentric, for the purpose of giving any required angle to the paddles at pleasure.

"And whereas such my invention is, to the best of my knowledge and belief, entirely new, and has never before been used, &c. &c."—[*Inrolled June*, 1829.]

Specification drawn by Mr. Rotch.

To David Redmund, *of Greek-street, Soho, in the county of Middlesex, Engineer, for his invention of certain improvements in the construction and manufacture of Hinges.*—[Sealed December 22, 1826.]

This invention is to be considered as an improvement on a former Patent, granted to Mr. Redmund in 1821, the particulars of which are given in the First Series of our Journal, Vol. V, page 178. In that instance the Patentee contrived a hinge, one half of which was made to rise by the cylindrical part being divided in the middle by inclined planes, and which enabled the door to close by its own gravity, but by means of two flat parts upon the planes, the door might be set open and remain so.

The great superiority of these rising hinges over others, designed for the same purpose, has brought them into very general use, and the object in the present instance is to render the same description of articles more effective

and more elegant in its appearance than the hinges on the plan of the former Patent were capable of being made.

There are two points of novelty proposed;—the first is to adapt a spring to the hinge, by which the door would be made to close with greater force than its own gravity would be capable of effecting; and, secondly, the operative parts are all enclosed so as to conceal them from view.

Plate X, fig. 12, shows the improved hinge, the barrel part being in section, for the purpose of exhibiting the interior; *a*, and *b*, are the two wings of the hinge, which are respectively connected to the upper and lower parts of the barrel *c*, *d*. The middle joint of the barrel is an inclined plane, and the upper portion *c*, carrying the wing *a*, turns upon a pin fixed in the lower part of the barrel, and there is a corresponding recess in the upper part, which is shown by dots in the figure.

Around the middle part of the barrel of the hinge, there is a ferrule or socket *e*, *e*, which covers the joint, and this ferrule being fixed to the wing *b*, remains stationary, and conceals the opening in the middle of the barrel, which would otherwise be visible when the wing *a*, rises. Thus the appearance of the hinge is rendered more neat and elegant than in its former construction.

The upper and lower parts of the barrel are both made hollow, and contain each a spiral spring coiled round a rod, which spring being made fast at one end to the rod, and at the other end to the barrel, becomes drawn up to tension by the opening of the door, and hence by the exertion of the force of the spring the door is closed again when left at liberty. The end pieces are inserted into the barrel by screwing, and may be of any figure or form that taste shall dictate.—[*Inrolled June,* 1827.]

To CHARLES HARSLEBEN, *of Great Ormond-street, Queen-square, in the county of Middlesex, Esq. for his invention of certain improvements in constructing or building Ships and other Vessels, applicable to various useful purposes, and in machinery for propelling the same.*— [Sealed 20th Dec. 1826.]

THERE are three distinct subjects embraced in this Patent; the first is an improved mode of constructing such vessels as are intended to be employed in the conveyance of fish, by which improvement that description of vessels will be enabled to be employed at times on other business, and may be propelled by machinery, instead of depending entirely upon the wind as heretofore; secondly, in an improved apparatus or system of paddles for propelling the same or any other description of vessels on water, by the power of steam, or any other first mover; and, thirdly, an improved apparatus for towing vessels against the current of a rapid stream of water.

As respects the first part of this invention, the mode of constructing vessels designed to convey fish, it is stated that it has been the practice to make wells or large receptacles in such ships for containing the fish, which being filled with water, allowed of the fish being conveyed alive to the port, market, or other place of destination. But these wells occupying a very large portion of the vessel, and the fisheries only requiring such vessels for a season, the greater part of the year they were altogether unemployed, and from the peculiarity of their construction, they were totally unfit for the conveyance of dry goods, or for any other business, which is a considerable loss to the proprietor, and a detriment to the vessel itself.

To remedy this inconvenience, and to render vessels designed for the conveyance of fish capable of being converted to other uses, the Patentee proposes to construct the wells in such vessels with water tight partitions, dividing them into several compartments, the different wells or compartments communicating with each other by means of cocks and sluices, so that certain portions may be emptied in bad weather by pumping out the water; and if occasion should require, at certain seatain seasons, parts or the whole may be kept dry for the stowage of goods of any description, and the vessel then rendered fit for general use.

The partitions separating the wells are to be made thick, and to contain air vessels between them, by which means the ship will be rendered buoyant, even if she were filled with water. It is further proposed to propel such vessels by steam power, and with the following improved paddles:—

Instead of the ordinary paddle wheels, it is proposed to employ a series of rotatory oars on each side of the vessel, mounted on perpendicular shafts, which oars are intended to traverse through the water in circles horizontally, and to turn over for the purpose of feathering, that is, performing the return stroke edgewise.

Plate X, fig. 5, represents the section of a flat bottomed vessel, with a set of the rotatory oars on each side; *a*, *a*, are two of the oars, which are in their propelling positions; *b*, *b*, are the corresponding oars, seen edgewise, performing the returning stroke. There are four oars attached to the end of the horizontal cross shafts, the faces of the opposite ones standing at right angles to each other. These horizontal shafts are mounted in plummer boxes in the lower part of the vertical shaft *c*, *c*,

and are enabled to turn round freely therein. The vertical shafts are mounted in and pass through the tubes *d*, *d*, shown in section, which are attached to the sides of the vessel by bracket arms *e*, *e*.

Any rotatory power, as that of a steam engine, being applied to the upper parts of the vertical shafts *c*, *c*, they will be made to turn, and to carry the horizontal paddle shafts round with them; (in the figure only two of the paddles are shown.) Those paddles, which are moving on the outer side, will perform that half of their horizontal revolution, with their broad faces acting against the water in the positions shown at *a*, *a*, which is giving the propelling stroke; and the paddle at the opposite end of each shaft, will pass through the inner half of its circuit, which is the back stroke edgewise cutting the water.

The mode by which the paddles are made to turn over, is by the tappets *f*, *f*, on the paddle arms, striking against an elongated part of the tube *d*, at *g*, which as the horizontal shafts go round, turn them over, and cause each paddle successively to fall into the positions shown at *a*, and *b*; the outer ones into the propelling position, the inner ones edgewise.

Any number of these sets of paddles may be placed along the vessel's sides, for the purpose of acting simultaneously, which may be put into operation in the way described, by connecting the upper parts of all the perpendicular shafts to the steam engine, or other actuating power, by which the oars or paddles will be made to revolve, and to row the vessel forward.

The section, fig. 5, represents a flat bottomed boat, with a false keel *h*; and if it should be desirable to employ paddle arms of a greater length than half the width of the vessel, it is proposed to cut away the false keel, in order to

let the paddles pass; and for the convenience of allowing the paddles to be repaired, the bracket arms *e*, are made to rise upon hinge joints.

As it may be desirable, under some circumstances, to propel vessels which are built with very sharp bottoms, fig. 6, represents a mode of placing the above described paddles in oblique directions, which may be made to revolve by any convenient mode of connecting the driving power to the paddle shaft.

Towing vessels up rivers or channels, in which there are very strong currents, is proposed to be done by the employment of a cross armed fan, with leaves or shutters, something like a horizontal windmill, which being mounted on a perpendicular shaft, is to be immersed entirely below the surface of the water; and the current being partly shut off by partitions in the fan case, the current is made to act against one half of the fan, only for the purpose of driving it round and giving the power to its shaft, which as a windlass coils up the towing rope attached to a vessel, and brings the vessel up against the stream.

Fig. 7, is a horizontal view of the fan *a*, with four arms placed at right angles. From the perpendicular frames connected to each of these arms, a series of flaps are suspended, which rise and fall upon hinge joints; *b*, and *c*, are two partitions affixed to the box or case, in which the rotatory fan is mounted. These partitions are so disposed that the current of the stream will only be allowed to act upon two of the fans at a time; the other two being shielded. Hence the force of the water bearing against the flaps of the fan, and these being stopped, by striking against the frame, cause the fan to be driven round; and the flaps on the opposite arms of the fan at the same time rising upon their hinges, and floating, pass through the water edgewise with little, if any resistance.

The power thus obtained being, as before said, applied to the shaft which is to act as a windlass, the towing rope attached thereto, draws a vessel through the stream, contrary to the course of the current.

As this fan and its case must be of very considerable dimensions, and may require to be occasionally shifted from place to place, in order to station it in the most favourable part of the current, it is proposed to construct it on a platform on the top of an air tight vessel as a caisson, which when required to be moved, may be filled with air, and then floated to its intended place of destination. When about to be fixed, the water must be let into the air vessel, and the top of it covered with large stones or other heavy bodies, as ballast, in order to keep it stationary and firm in its position; and when about to be moved, the ballast must of course be removed, and air pumped into the caisson, for the purpose of displacing the water occupying the vessel.

The rotatory fan having been applied to a similar purpose before, the Patentee limits his invention, as respects the towing apparatus, to the partitions *b*, and *c*, which shut off and guide the current of the water.—[*Inrolled June,* 1827]

To THOMAS LAWES, *of the Strand, in the county of Middlesex, Lace Manufacturer, for his invention of an improvement in the manufacture of Bobbin Net Lace.*—[Sealed 10th Dec, 1828.]

THE invention specified and claimed under this Patent is confined to the manufacturing of bobbin net lace with single threads, instead of doubled threads as generally used.

The Patentee proposes to emerse the threads in size made from flour, gum, or glue, but he prefers glue; and

as the threads are wound from one bobbin to another, to pass the threads through the thumb and finger of the operator, to remove all superfluous size.

By the employment of these single threads, a kind of lace may be made, which will be much thinner and cleaner in its appearance than the lace of the ordinary kind.—[*Inrolled June*, 1829.]

Polytechnick and Scientific Intelligence.

AMERICAN PATENTS.

For a thrashing machine; Matthew Barney, Nantucket, Mass. August 5.

THIS machine is, in form, something like the common horse gin. There is an upright shaft, with a bar projecting out, to which the horse that turns it is attached. Three arms, eighteen feet long, and fourteen inches wide, are passed through mortices, so as to form six radii from the centre of the shaft: these are connected together by six pieces of plank, each passing from the lower edge of one arm, to the upper edge of the next arm, and, consequently, forming six inclined planes. Eight flails, or thrashers, eleven feet long, work side by side, upon one common pin; their short ends, three feet in length, pass under the wheel, and are tripped by it as it passes round; the whole making 48 strokes in each revolution.

The grain is placed upon a table standing under the outer ends of the thrashers; this table traverses backwards and forwards, by means of a windlass. The patentee says, "by placing flax or hemp on said table, I believe it will break it equal, if not better, than any other way."

For a method of casting moveable Printer's Types; whereby the process is rendered practicable by mechanical means, and its expense much abridged; Wm. M. Johnson, New York, Aug. 21.

The description of the apparatus and process, which form the subject of this patent, is of great length, occupying upwards of thirty closely written pages; besides which, there are about twenty well delineated figures, with seven pages of descriptive reference. The concluding part, in which the Patentee states his claims, will afford a pretty full and clear idea of the nature of the invention.

" The improvements which I claim by right of original invention are—

" 1st. The giving to the mould, by the turning of a crank, all the motions that are requisite in it in casting, viz. the opening and shutting the mould with proper force and accuracy; the raising of the matrix, and the discharging of the type; said operations of the mould being performed by means of the mechanism above described, or by any other that merely varies the form, without improving the process.

" 2dly. The peformance of all the motions of the kettle apparatus, by the turning of a crank, viz. the producing and stopping of the metal through an aperture in the kettle, and giving it the needful force; this operation being performed by means of the mechanism herein described, or by any other that merely varies the form, without improving the process; not intending to embrace within this claim, the use of a stopper alone, or a plunger alone, but the use of the two together, when worked by a crank.

" 3dly. The use of a moveable cover, to the cavity of the mould, by means of a distinct piece coming between the kettle and the mould, to prevent the metal from overrunning it when forced into the mould; this appendage being applied in the manner afore stated, or in any other

that merely varies the form without improving the process.

"4thly. The covering and uncovering the cavity of the mould (with the said cap or cover), by the turning of a crank; this action being effected by means of the mechanism afore described, or by any other that only varies the form without improving the process.

"5thly. The application of water to the mould, by a rapid dropping, or constant stream upon it, whilst casting, when worked by a crank, as afore described; and also the application of water to the cap, by the means above stated, or by any other that merely varies without improving the mode; it is not intended in the claim, to embrace the use of water to the mould in all shapes, but merely its use by a *constant passage* of it when applied to one side of the mould alone, and when applied to the cap, or to the two sides of the mould together, by any kind of a stream or passage of it, or by any means that merely varies without improving the mode.

"6thly. The combined use of the plunger with valves, and a stopper rod, in a stationary kettle, that has the fire around it; said plunger and stopper being attached to the kettle in the manner afore stated, or in any other, &c.

"7thly. The use of compressed atmospheric, or other air upon the surface of the melted metal, to give it the needful impetus into the mould, said power being applied in the manner herein described, or by any other &c.

"8thly. The combined action of the mould, cap, stationary kettle, plunger, and stopper, or air pressure, in lieu of plunger and water, by means of a crank as afore specified, or by any other, &c. It is intended, in this particular claim, to embrace only the *combination* of the several parts, as affording, in their united operation, a new process, and a certain degree of improvement.

"9thly. The removing the mould from the kettle, in order to discharge the type by causing an immediate separation between the two, by taking the mould off from the kettle in a line with the direction of the stream of metal that is injected into the mould, or at any angle with that line, without having any sliding upon the surface of the kettle, or other friction against it, further than that produced by the taper point of the spout, in contact with the hole of the cap."

For an improved machine for washing all kinds of wearing aapprel, &c.; Jonathan R. Davis, Hartland, Niagara county, New York, Sept. 4.

This machine has a wash-board, very similar to that which has been so extensively used in this country, having grooves across it, upon which the clothes are rubbed by hand, instead of being rubbed between the hands. The present patentee adds a grooved roller, which is to be fixed in a suitable frame; the clothes, &c. to be washed, are laid upon the grooved board, where they may be kept moistened with soap-suds, and the grooved roller is passed backward and forward over them, the frame in which it revolves being held in, and guided by, the hand; there are, also, grooved guides on the frame, which work on projecting strips on the edge of the wash-board, to retain the roller and frame in their places.

For an improvement in the machine for washing cloths; Joseph Hathaway and Rufus Hathaway: the former of Pultney, Steuben county; the latter of Canandaigua, Ontario county, New York, September 5.

This machine consists of two hollow cylinders. The outside cylinder is fixed in a suitable frame, its axis being

horizontal. This cylinder is made water-tight, and is divided into two parts, the lower half forming a trough, and the upper half a cover or lid. Within this cylinder, another is made to revolve, by means of a crank and gudgeons. The circumference of the inner cylinder, is formed by slats, dove-tailed into the circular ends, and standing about three quarters of an inch apart. Into this, the cloth to be washed is put, there being a door for that purpose. The slats are sloped on the sides in reversed directions, so that when the inner cylinder is turned either way by the crank, the water shall have a tendency to flow from the outer into the inner cylinder. The motion proposed to be given, is a vibratory one, by turning the crank each way, about half a revolution. On two opposite slats, pins are placed, pointing towards the centre of the cylinder; these are intended to change the position of the cloth to be washed. The frame is to be kept together, and tightened, by iron rods, with heads, screws, and nuts.

This machine, in its general features, bears a strong resemblance to others which have been heretofore used; the patentees say, "what we claim as new, and as our own invention, in the above described machine, is the operation of the open cylinder, and the manner of fixing in those slanting slats, to carry the water to every part of the machine, to serve as drenchers; also the iron rods that fasten the frame together."

For a socket vice. Granted to Luther Hemminway, of Sullivan, Cheshire county, New Hampshire, September 4, 1828.

The socket vice may be made of any size, according to the use to which it is to be applied, and of metal or wood. When made to be used as a socket for awls, it should be

of steel; its whole length should be about two inches and three fourths; one end, for about three fourths of an inch, should be round, and about one fourth of an inch in diameter; beginning three eighths of an inch from the end, it should taper slightly to the end, upon which, for the same distance, a screw should be cut; it should then diminish, and again increase in diameter, in both cases slightly, and gradually; at three fourths of an inch from the end it is flattened abruptly, forming a shoulder on two sides, and is made tapering on the two edges, to the other end, where it is pointed; a hole is made longitudinally into the round end, about three fourths of an inch deep; t is then cut twice transversely from the end to the bottom of the hole, dividing it into four equal parts; a hollow screw or nut, adapted to the vice, is screwed upon this end, compressing it so as to hold firmly the shank of the awl; the outside shape of the nut should be square, so that it may, by means of a small wrench, be easily screwed on or off. The pointed end of the socket vice may be inserted in a handle of wood, so far as to the commencement of the screw. When made for other uses, the size and the form of the shank may be varied, to suit such uses.

SOCIETY OF ARTS.

Our last notice of this Society in Vol. II, page 346, contained an account of the commencement of Mr. Aikin's Lectures, delivered before the members and their friends on Tuesday evenings. It was our intention to have continued reporting the whole of these lectures at considerable length; but although the subjects were arranged with considerable ability, and written with neatness and perspicuity, yet there appeared to be little or no features of novelty developed, and the principal matters for admira-

tion were the superb specimens of art which were lent to the society for the occasions, by the members and their friends. We therefore relinquished our purpose, conceiving that a mere catalogue of rare and curious articles would have afforded neither information or amusement to our readers.

The Society have now discontinued their meetings for the present sessions, having distributed their rewards, both honorary and pecuniary, among the successful candidates for their approbation.

The presentation of medals adjudged in the class of Polite Arts took place first, when His Royal Highness the Duke of Sussex presided in the Society's Great Room, and with many complimentary observations, bestowed the various medals of gold and silver upon the juvenile artists, as stimulants to future exertions.

On a subsequent day, the productions which may be denominated scientific, were rewarded by the President in the same place in the following order:—

Mr. J. Vendramini, 14, Brompton Row, from his engraving from the picture by Sebastian del Piombo of the Raising of Lazarus—the large Gold Medal.

Mr. J. Robertson, Worton House, Isleworth, for his improvements in the art of painting in water-colours—the Gold Isis Medal.

Mr. Joseph Netherclift, 8, Newman Street, for his improved method of making lithographic transfers—Twenty Pounds.

Thomas Dowler, M.D. for his musical instrument called the glossophone—the large Silver Medal.

Mr. J. Cuthbert, 5, Purbeck Place, Lambeth, for his stand for an astronomical telescope—the large Silver Medal and Twenty Pounds.

Mr. W. H. Hilton, 10, Regent Street, for his pump for racking wine—the large Silver Medal.

Mr. R. Parvin, 3, Carpenter Street, Mount Street, for his improved French window—the Silver Isis Medal and Five Pounds.

Mr. W. Tindall, Leeds, for his wheel with an oblique axle—the Silver Isis Medal.

Mr. W. Aust, Hoxton New Town, for a copper lining to a leaden pump-barrel—Five Pounds.

Mr. T. Williams, Lieut. R.N. for his oars to be worked by one hand—the large Silver Medal.

Mr. W. P. Green, Lieut. R.N. for his yoke for a disabled rudder—the Silver Isis Medal.

Mr. W. Rodger, Lieut. R.N. for his syphon for watering ships—the Gold Isis Medal.

Ditto, for his make-shift anchor—the large Silver Medal.

Mr. Edward Carey, R.N. for his method of preventing dry rot in ship timber—the large Silver Medal.

Mr. T. Reynolds, 13, Arbour Terrace, Commercial Road, for his repeating stop for a naval sextant—the Gold Isis Medal.

Mr. D. Davies, 15, Wigmore Street, for a fire escape—the large Silver Medal.

Mr. S. Mordan, 22, Castle Street, Finsbury, for his self-centering lathe-chuck—the large Silver Medal.

Mr. Joseph Clement, 19, Prospect Place, St. George's, Southwark, for his self-acting double driver for a lathe-chuck—the large Silver Medal.

Mr. James Roberts, 7, Abbey Street, Bethnal Green Road, for his improvements in weaving velvet—Five Pounds.

Mr. J. Hughes, 93, Sebright Street, Bethnal Green, for

his improved cards for weaving figured silks—the Silver Isis Medal and Fifteen Pounds.

Mr. C. S. Smith, 3, Kirkman's Place, Tottenham Court Road, for his method of manufacturing melting pots for iron and steel—Twenty Pounds.

Mr. R. Green, 57, Ernest Street, Regent's Park, for his draining plough—Fifteen Pounds.

Mr. J. Pearson, Frittenden, Kent, for his draining plough—the large Silver Medal and Fifteen Pounds.

Joseph Kirby Trimmer, Esq. Strand on the Green, Kew, for his flock of improved Merino sheep—the large Gold Medal.

Josias Booker, Esq. Liverpool, for his substitution of machinery in aid of slave labour—the large Gold Medal.

DIORAMA.

The conductors of this delightful and fashionable exhibition have presented the public with two new pictures—a view of the little town of Thiers, in the province of Auvergne in France, and the interior of the church of St. Peter's at Rome.

In the execution of the first of these pictures the artist has displayed a degree of talent certainly not surpassed, if equalled, in the finest productions of former exhibitions.

The scene is of limited extent, and though in the neighbourhood of a town, appears to be a peaceful seclusion. The haziness of morning almost conceals the peeping tops of distant hills, and the only animated object seen is a miller quietly seated by his door, enhaling the morning breeze. Near the foreground the mill stream flows with

glassy smoothness, and partially breaking through its rugged banks presents a moving silvery foam, the very semblance of nature.

Turning to the picture of St. Peter's, we are not able to speak with equal commendation. This colossal structure, though magnificent in its design, is gaudy in its decorations; and the association of colours and gilding detract greatly from the sublimity of the scene. The artist is in this respe t unfortunate in the selection of his subject; but that is not all—the picture, (certainly a difficult one to execute) falls considerably short in effect, particularly in the prominent parts of the sculpture, which are not brought out with that delicacy of touch so peculiarly necessary in representing the soft relief of marble.

New Patents Sealed in 1829.

To Maxwell Dick, of the town of Irvine, in the county of Air, North Britain, bookseller and publisher, for his having invented an improved rail road, and method of propelling carriages thereon by machinery, for the purpose of conveying passengers, letters, intelligence, packets, and other goods, with great velocity. 21st May—6 months.

To Thomas Robinson Williams, of Norfolk Street, Strand, in the county of Middlesex, Esq. for his having invented improvements in the making or manufacturing of felt, or a substance in the nature thereof, applicable to covering the bottoms of vessels, and other purposes. 23d May—6 months.

To Thomas Arnold, of Hoxton, in the county of Middlesex, tin plate worker, for his invention of a new or improved machine or gauge, for the purpose of denoting the quality or strength of certain fluids or spirituous liquors, and for measuring or denoting the quantity of fluids or spirituous liquors, withdrawn from the vessel or receptacle in which the same are contained, and which machine or gauge may be so constructed as to effect

either of the above objects without the other, if required. 26th May—6 months.

To William Poole, of the parish of Saint Michael on the Mount, in the City of Lincoln, smith, for his having invented certain improvements in machinery for propelling vessels, and giving motion to mills and other machinery. 26th May—2 months.

To Charles Turner Sturtevant, of Hackney, in the county of Middlesex, soap boiler, for his having invented certain improvements in the process of manufacturing soap. 26th May—6 months.

To Joseph Clisild Daniell, of Limpley Stoke, in the parish of Bradford, in the county of Wilts, clothier, for his invention of certain improvements in machinery, applicable to the dressing of woollen cloth. 26th May—6 months.

To Ross Winaus, of Vernon, in the county of Sussex, and State of New Jersey, in the United States of North America, at this time resident in London, for his having invented certain improvements in diminishing friction in wheeled carriages, to be used on rail and other roads, and which improvements are applicable to other purposes. 28th May—6 months.

To William Mann, of Effra Road, Brixton, in the parish of Lambeth, in the county of Surrey, Gentleman, for his having discovered or found out, that by the application of compressed air, power and motion, can be communicated to fixed machinery, and to carriages, and other locomotive machines, and to ships, vessels, and other floating bodies. 1st June. 6 months.

To Andrew Gottlieb, of Jubilee Place, Mile End Road, in the county of Middlesex, locksmith, for his having invented certain improvements on, or additions to locks and keys. 1st June—6 months.

To John Smith, of Bradford, in the county of York, corn miller, being one of the people called Quakers, for his having invented certain improvements in machinery for dressing flour. 4th June—2 months.

To Charles Brooks, of Meltham Mills, near Huddersfield, in the county of York, cotton spinner, for his having invented certain improvements in machinery for spinning cotton and other fibrous substances. 4th June—6 months.

To Robert Porter, of Carlisle, in the county of Cumberland, iron manufacturer, for his having invented a certain improvement or improvements in the manufacture of iron heels and tips for boots and shoes. 13th June—2 months.

To Francis Day, of the Poultry, in the city of London, optician, and Auguste Münch, mechanic, of the same place, in consequence of a communication made to them by a certain foreigner residing abroad, and inventions by themselves, for an invention of certain improvements on musical instruments. 19th June—6 months.

To Charles Wheatstone, of the Strand, in the county of Middlesex, musical instrument maker, for his having invented a certain improvement or certain improvements in the construction of wind musical instruments. 19th June—6 months.

To Moses Poole, of Lincoln's Inn, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improved machinery for preparing or kneading dough. 19th June—6 months.

List of Patents,

GRANTED IN SCOTLAND SINCE MARCH, 1829.

For certain improvements on the Steam Engine. To John Udny, Esq. county of Middlesex.

For a certain medicine or embrocation to prevent or alleviate sea sickness. To Philip Derbyshire, Esq. county of Middlesex.

For an improvement on machinery and apparatus for embroidery or ornamenting cloths, &c. To Henry Bock, Esq. London.

For an improvement in the construction of made masts. To Richard Green, county of Middlesex.

For an improvement in the process of making iron. To Josias Lambert, Esq. London.

French Patents,

GRANTED IN JANUARY, FEBRUARY AND MARCH, 1829.

To Geniez, M. A. Chaumette, Paris, for ink-stands with valves. 10 years.
— Charles Laurentpère, Paris, for an airiforous apparatus to preserve corn. 15 years.
— Ferdinand Charles Briant, Paris, for an antiphlogistic syrup. 5 years.
— Belandine Antoine Laureys, Paris, for a coffee-boiler. 5 years.
— Jean Jacques Herbault, Paris, for a coach to carry travellers. 10 years.
— Chretien Heiligenstein, Paris, for pottery furnaces. 5 years.
— Pierre Pinomat, Amiens, for a wind instrument he calls "Typotom." 5 years.
— Theodore Chenevière, Louviers, for a brushing-machine. 5 years.
— Ithier, Senior, Vienne, for a machine to spin wool. 10 years.
— Jolin Dubois, Nantes, for a machine to clear and bleach pepper. 5 years.
— Gay Cazalat, Versailles, for an aerostatic lamp. 10 years.
— Marie Hough Delhoglie, Paris, for a coffee and chocolate, she calls "de Sante." 5 years.
— Denis Joseph Bouché, Paris, for a combing machine. 10 years.
— Oneriphore Pecquar, Paris, for improvements in steam engines. 15 years.
— Bernard Romain, Bagnols, for a method to learn to read and to write. 10 years.
— Simon Mialle, Paris, for a method to learn to read. 15 years.
— Pleyel and Co. Paris, for a new sort of foot, applicable to square piano-fortes. 5 years.
— Besnier Duchaussáis, Paris, for a carriage with three wheels, "Tricydes." 15 years.

To Paul Girandet, Lyons, for a process to burn gypse. 10 years.
— Louis Baudry, Villedieu, for a process to stamp culinary vessels. 15 years.
— Maurice Daninos, Paris, for a process to manufacture hats and bonnets. 10 years.
— J. J. Gonon, Lyons, for a mechanical umbrella. 5 years.
— N. Blanchet and Roller, Paris, for a new escapement to pianofortes. 5 years.
— Joseph Rayner, London, for improvements in shearing machines. 10 years.
— Paquy, Paris, for a new method to manufacture the horsehair applied to casques of cavalry. 5 years.
— Tirnier Prevost, Paris, for an apparatus he calls "Eusmophore." 5 years.
— Bertin, Paris, for a steam-carriage he calls "Pyrobalistics." 15 years.
— Pierre Fasanini, Lyons, for a mechanical loom. 10 years.
— Alexandre Lorgnier, Boulogne, for improvements in the manufacture of tiles. 15 years.
— Rehaist, Paris, for a lamp at constant level. 5 years.
— Leger Clerc, Lyons, for a shuttle with a retrograde motion. 5 years.
— Bourguien and Co. Lyons, for a loom bottom to weave three ribbons at once. 5 years.
— Hypolite Fuguel, Marseilles, for a machine to move heavy weights. 5 years.
— Miche Fraisse, Briare, for portable cranes. 5 years.
— Elinme Pelletior, Ladoué, for a press. 10 years.
— Debesiz, Paris, for a process to consolidate shoes, &c. 10 years.
— Chaumette, Paris, for a new system of playing cards. 15 years.
— François Dize, Paris, for an harp with double motion. 5 years.
— Mevil, Caron, and Amongaud, Paris, for a coach they call "Colibri." 5 years.
— Charles Choreau, Paris, for a mechanical billiard. 10 years.
— A. J. Huet, Paris, for a moveable paddle water-wheel. 10 years.
— Amedéc Durant, Paris, for a portable horsewheel. 5 years.
— Alexandre Kay, Paris and Manchester, for a combing machine of flax, &c. 15 years.
— Charles Duhamel fils, Orleans, for a coach train with broken axle-trees. 5 years.
— Josui Heilmann, Mulhausen, for an embroidering machine. 15 years.

To Pierre Fusz, Ineming, for a method to skid a coach-wheel—10 years.

— James Collier, Paris, for process to employ a certain substance to produce light and heat. 10 years.

— J. P. F. Collain, Sabron, for a serpentine fire-place and chimney. 15 years.

— Joseph Croucher, London, for improvements in chronometers. 15 years.

— Jacques Crevel, Rouen, for a method to ring the bells without moving them. 15 years.

— Clement Pottet, Paris, for a shutting gun. 10 years.

— Guy Frères, Paris, for machines to make bread. 15 years.

— J. P. M. Teissier, Paris, for a process to keep razor strops in good order. 5 years.

— Coisplet, Paris, for machinery to manufacture culinary articles. 15 years.

— Louis George, Uzès, for a new letter case. 5 years.

— Prosper Meyner, Lyons, for a mechanical loom button. 10 years.

— L. P. Senechâl, Paris, for improved scissors. 5 years.

— P. H. Covillion, Cognac, for a paste to manufacture architectural ornaments. 5 years.

— Delbourn, Paris, for improvements in pencils, slides, &c. 5 years.

— Morel, Paris, for a process to destroy bugs. 15 years.

— Jean Louis Jaume, Paris, for improvements in burning lime. 15 years.

— Jean Franeois Salomon, Besançon, for an instrument he calls "Harpolyre." 5 years.

— Soyer et Ingé, Paris, for a clock-sphere. 5 years.

— August Laurens, Châtillon, for a method to learn to read. 5 years.

— Alexander Fitchet, Paris, for a surety-lock. 5 years.

— Jone et Camaret, for a serpentine boiler. 5 years.

— P. L. Guimberteau, Paris, for a moveable coach axle-tree. 5 years.

— J. L. Robert, Paris, for an improved coach-step. 5 years.

— Gué, Paris, for a boat he calls "Hydrorama." 5 years.

— Pitray et Vid, Charlestown, for a rice-mill. 15 years.

— Villeneuve, Paris, for improvements in knives. 5 years.

— Truffaut, Paris, for a method to employ iron in sheathing ships. 5 years.

— Brasseur, Senior, Paris, for an improved seal. 5 years.

— Pascal Guesnier, Rouen, for an hydraulic bed. 5 years.

— Chaumette, Paris, for a mechanical process to promote salubrity in towns. 10 years.

CELESTIAL PHENOMENA, FOR JULY, 1829.

D	H.	M.	S.	
1	5	0	0	☽ in conj. with ☿ long. 21° in Gemini.
				☽ lat. 4° 43' S. ☿ lat. 4° 3' S. diff. lat. 40'
3	23	0	0	☽ in conj. with ζ in Leo.
4	3	0	0	☽ in conj. with ο in Leo.
4	13	0	0	☽ in conj. with π in Leo.
5	0	0	θ	Clock before the ☉ 4' 7"
6	11	0	0	☽ in conj. with τ in Leo.
8	5	0	0	♀ in conj. with ♂ long. 28° in Gemini.
				♀ lat. 1° 18' N. ♂ lat. 1° 9' N. diff. lat. 9'.
8	17	0	0	☽ in conj. with θ in Virgo.
8	18	31	0	☽ in ▭ first quarter.
10	0	0	0	Clock before the ☉ 4' 55"
10	1	0	0	☽ in conj. with κ in Virgo.
11	17	0	0	☽ in conj. with γ in Libra.
12	1	0	0	☽ in conj. with θ in Libra.
12	18	0	0	☽ in conj. with φ in Oph.
13	5	0	0	♀ in conj. with ♃ long. 5° in Cancer.
				♀ lat. 1° 24' N. ♃ lat. 35' N. diff. lat. 49'
13	14	0	0	♀ in conj. with δ in Cancer.
15	0	0	0	Clock before the ☉ 5' 32'
16	0	0	0	☿ Stationary.
16	2	42	0	Ecliptic opposition, or ● full moon.
16	16	0	0	☾ in conj. with β in Capri.
16	23	0	0	♃ in conj. with δ in Cancer.
18	15	0	0	♂ in conj. with δ in Cancer.
18	15	0	0	☾ in conj. with θ in Aqua.
19	0	0	0	♂ in conj. with ♃ long. 6° in Cancer.
				♂ lat. 1° 9' N. ♃ lat. 36' N. diff. lat. 33'.
20	0	0	0	Clock before the ☉ 5' 56"
22	10	0	0	☾ in conj. with ο in Pisces.
22	17	1	0	☉ enters Leo.
22	18	14	0	☾ in □ or last quarter.
25	0	0	0	☾ Clock before the ☉ 6' 7"
25	0	0	0	☿ in conj. with ζ in Gemini.
25	6	0	0	☾ in conj. with λ in Taurus
25	7	0	0	☾ in conj. with 1 δ in Taurus
25	8	0	0	☾ in conj. with 2 ρ in Taurus
25	13	0	0	☾ in conj. with α Taurus.
28	13	0	0	☿ in conj. with δ Gemini.
29	0	0	0	♃ Stationary.
30	0	0	0	Clock before the ☉ 6" 4'
30	5	39	0	Eliptic conj. or ● new moon
30	19	0	0	♀ in conj. with α in Leo.
31	6	0	0	☽ in conj. wiih ζ in Leo.
31	20	0	0	☽ in conj. with ο in Leo.
31	20	0	0	☽ in conj. with π in Leo.

☽ the waxing moon.—☾ the waning moon.

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR MAY AND JUNE, 1829.

1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
MAY					
26	65	49	30,34	30,26	
27	67	42	30,22	30,20	
28	71	43	30,19	30,13	
29	67	45	30,13	Stat.	
30	60	40	30,13	30,11	
31	66	37	30,11	Stat.	
JUNE					
1	66	49	30,16	30,12	
2	75	41	30,21	Stat.	
3	79	55	30,16	Stat.	
4	73	38	29,98	29,93	
5	67	49	29,98	29,92	
6	59	37	30,19	30,11	
7	63	46	30,26	30,22	
8	63	45	30,26	Stat.	
9	65	53	30,26	Stat.	,075
10	69	54	30,31	30,26	

1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.	
JUNE					
11	71	35	30,39	30,31	
12	75	47	30,26	30,24	
13	79	43	30,24	30,19	
14	60	58	30,19	30,11	
15	77	49	30,06	29,90	
16	62	50	29,76	Stat.	
17	70	41	29,77	29,76	,075
18	64	48	29,96	29,78	,1
19	69	45	29,96	Stat.	,175
20	73	49	29,86	29,83	
21	73	55	29,74	Stat.	,125
22	69	53	29,76	Stat.	,125
23	75	55	29,89	29,77	,15
24	76	56	29,96	29,92	,325
25	75	46	30,02	29,91	

Edmonton. C. H. ADAMS.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XVII.

[SECOND SERIES.]

Original Communications.

Art. XIV.—On Bernard's Patent for raising Water.

To the Editors of the London Journal of Arts, &c.

Gentlemen,—I have perused with considerable attention your account of Mr. Bernhard's Patent for raising water.—I cannot comprehend how, by the agency of any increase of temperature, that the water in the boiler should effect an elevation of forty feet above the torricellian result the increase of water as to bulk between the freezing and boiling points could not exceed one twentieth of the column; by any such operation the difference would not exceed one and half foot. As you state that the practical part is correct, I am not aware of any theoretical explanation, I presume it resolves itself into this. Is it practicable to raise water seventy feet in a tube when exhaustion has been affected, by the application of heat to any part of the external surface of the said tube, supposing the water already raised in the tube thirty feet by the air pump. If any of your cor-

respondents would be so obliging as to explain to me this difficult subject, it would confer a favour on one of your constant readers.

Yours, &c.

OBSERVATOR.

P. S. May I request from any of your ingenious readers—a simple and efficient method of keeping up a constant stream of water, through a half inch pipe, from a depth of about thirty-five feet.

Observator is not the only one of our correspondents who has expressed the same opinion on Mr. Bernhard's invention, and in which we fully concur; as however Mr. B. insists upon having made a new discovery in science, and has promised to favour us with his views of the principles upon which he raises water to the extraordinary height of seventy feet, we have thought it desirable to withhold our explanation of the experiment, until Mr. B. has put forth his own, which we hope will be in our next number.

EDITOR.

XV.—DR. WILKINSON ON SWEEPING CHIMNIES.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN.—A period of more than ten years has elapsed since benevolent societies were formed for the purpose of employing Machinery for sweeping of Chimnies. When application was made to the Legislature for its interference, a Committee was appointed in the House of Lords, in order to obtain that correct information which generally results from such an investigation. I had the honour of being summoned on that occasion, and I then attempted to impress upon the minds of those noble Lords that were present the capability of sweeping, with very few exceptions, chimnies of every description, by means of an

admirably constructed apparatus, the invention of Mr. Fryer, in this city. From its construction, being of twisted canes, round a central stick of ash, or cane, it possessed every requisite pliability, so as to enable chimnies very curved being swept, that could not be effected by machines previously invented. Lord King so much approved of its construction, that, at his request, I procured one from the able engineer of the Gas Works (Mr. Eastwick), who made one for his lordship, and he superintended the manufactory of those which were liberally distributed to the chimney sweepers in this city, from the excellent institution in Monmouth street.

Some hopes were entertained that, by presenting the masters with an apparatus, and in remunerating them in proportion to the number swept, that this praiseworthy plan would have been carried into efficient execution. When the money subscribed was expended, and the machines required reparation, the stimulus no longer existing, chimnies were purposely badly swept, and soon after they had recourse to the old plan of climbing boys.

By the employment of machines it is evident that the principal labour devolved on the master; and when bribery terminated he preferred rather to be maintained by the work of the climbing boys than by his own exertions.

Within the last year, an attempt has been made to revive these societies, and principally on the supposition, that an apparatus has lately been invented by a person of the name of Glass, by which all objection to this mechanical mode of sweeping are completely obviated. The only difference between this and the one invented by Mr. Fryer, is the material employed—the new one being of bamboo, and Mr. Fryer's of eight or nine small canes twisted round a central part of ash or cane. Both are divided into lengths, but the mode of screwing in Mr. Fryer's is superior to the other. In the principle of action there is, comparatively, so little difference, as to leave no doubt that to Mr. Fryer the world is indebted for the ori-

ginality of the invention, and I believe it can be made and obtained on more reasonable terms.

I am apprehensive that, with a machine of the most perfect kind, the plan will never be generally adopted, whilst this present system, with respect to climbing boys, is continued, and particularly as we have not arrived at that degree of perfection so that every chimney can be cleansed by mechanical means; and it cannot be expected that the present proprietors of houses would be inclined to incur the expense that would attend any such required alteration; so that all which could be reasonably hoped for, would be to employ machinery where practicable, and climbing boys only in cases of necessity.

I consider of greater importance the adoption of a plan by which may be prevented the idle and ultimately dissipated habits which these climbing boys acquire, so long as their employment may be deemed in any case absolutely necessary. The little chimney sweeper, in general, finishes his work about ten o'clock in the morning; the remainder of the day is passed in idleness. Seeds of depravity are early sown; and when he has outgrown his capability of climbing, he has recourse to immoral practices for his subsistence.

About two years since, a poor fellow thus situated committed a depredation in a cabinet maker's shop for the purpose of being transported. There is one at present in this city, in the greatest distress from not having any employment, and he states that he suffered more constitutional distress by remaining in the streets early in the morning, exposed to great inclemencies of weather, frequently for hours, owing to the idleness of the servants, than from his occupation. In this respect there ought to be a regulation—for them not to be required to attend before five in the summer and six in the winter. Owing to a similar exposure, some years since, a lad named George Lane was so afflicted as as be sent to the Poor-house; he excited the attention of one of the overseers, of the name of Ewens, in Westgate-street. A

soon as the boy was enabled to leave the Poor-house, he was taken into Ewens's service: he turned out to be very attentive, punctual, and extremely valuable to his employer. In the evenings, a French gentleman, then residing on the Parades, gave him instruction, and he made such progress, that, by the time he arrived at manhood, his talents were considered competent to qualify him to go to Sierra Leone as a missionary, and he conducted himself with great credit in that settlement.

I presume to suggest the following plan :—Suppose a tinman' smith, or brazier, engaged to clean such chimnies as are practicable with machines, and to have one of the climbing boys as an apprentice to sweep those chimnies which will not admit of the apparatus ; then such lad, when not employed, to be occupied in the business of his master, so that, at a future time, he would have a trade for his support ; the results of the idleness above stated, would be avoided, and such a measure would soon operate to the great diminution of chimney sweepers—it would become part of another occupation, and particularly as all new houses would be built with chimnies free from those curvatures observed in many old buildings.

I know a brazier, smith, and tinman, disposed to make an arrangement as above suggested. He is one well qualified for such an undertaking, and is prepared to unite in the concern with a master chimney sweeper, and to have two climbing boys as apprentices. They would be instructed in the trades, to enable themselves to obtain a livelihood. The instruction of the master sweep would suffice for their knowledge of climbing. There is no doubt of being encouraged by every benevolent housekeeper; nor should I presume that a little difference in the charge would be regarded.

In order to carry this plan into effect, if, for the first two years, a subscription, competent to pay 8s. per week for the two boys' board, were made, the person alluded to would undertake to carry such plan into execution, by receiving one shilling

for each chimney and 1s. 6d. for kitchen chimnies, from those persons who may be disposed to employ him.

If Societies were formed in different large towns, in order to patronize a trial of this kind, the impression on my mind is, that it would more materially contribute to the melioration of this branch of society than any other I have heard of, and my trivial assistance would with pleasure be given.

C. H. Wilkinson.

Sydney Place, Bath.

Recent Patents.

To Edward Cowper, *of Clapham Road Place, in the Parish of St. Mary, Lambeth, in the County of Surrey, Gentleman, for his invention of certain improvements in printing Music.* —[Sealed 5th April, 1827.]

The ordinary process of printing musical compositions on paper has heretofore been, by first engraving the subjects in plates of metal, copper, or pewter, then inking them, and taking the impressions by means of a roller-press in the manner of copper-plate printing. The adaptation of types in the way of letter-press printing to this purpose, though obviously suited to the general style and appearance of printed music, has been attended with so much difficulty as to have been hitherto considered impracticable. By the plan, however, proposed by the Patentee, the operation is rendered perfectly simple, and types, or surfaces of a similar kind to types, are applied to the printing of music with perfect ease and dispatch.

There are two particular features in this Patent which ap-

pear to constitute the subject of invention, viz. 1st. The method of constructing the form of types or blocks to be printed from; and 2dly, the manner of placing and shifting the sheets of paper to receive the impressions.

It is proposed, that the subject to be printed shall be divided into two blocks, the one containing the lines and partitions of the musical scale, the other, the notes arranged at their proper distances, and in correct order. To perfect a print, therefore of the entire subject, two impressions must be taken; that is, the scale of lines being first produced on the sheet of paper, a second impression is necessary for the purposes of printing the notes; which two impressions being made to fit exactly together (called registering), the printed subject, that is, the page of music will be complete.

The blocks for printing the page of music in this new way are shown in plate XI, at fig. 1. The compositions are placed within an iron frame or chase, and properly wedged up with quoins *a a*, are the blocks or pieces for giving the lines, made fast within the chase; *b b*, those for giving the notes.

The lines are formed by thin strips of metal set edgewise in the same way as lines are made in ordinary letter-press printing. Thin pieces of venere may be placed between each slip of metal, and the whole fastened together by glue, so as to constitute the five lines of the musical scale, or the lines may be made by several other obvious modes.

These sets of lines are to be placed within the chase at proper distances apart. They are capable of adjustment as to position, by means of the screws and nuts by which they are held at their ends; and between the sets of lines the words of the song or other poetical composition may be introduced, if necessary: which the Patentee proposes to set up in the ordinary way, with metallic letter types, and to cast them in long narrow slips of stereotype plate, which shall fit in between the sets of lines, and correspond with the situations of the notes.

The blocks *b*, *b*, containing the notes, are flat slabs of wood,

on which, in the first instance, lines are to be drawn, corresponding exactly in their positions with the lines in the other chase *a*, *a*. Upon these lines the musical composition, that is the notes of the tune, are to be written in their proper places; and when that is done, small holes are to be drilled in the wooden slabs, for the purpose of introducing pieces of wire. The ends of these wires being cut off, a little above the surface of the slab, their tops are to be dressed smooth by a fine file, leaving them standing up like round types.

The tails of the notes, designating crotchets, quavers, &c. and their connecting pieces, may be made by the introduction of small stripes or bars of metal let into the slab; and the other marks, which occasionally occur in music, such as flats and sharps, may be formed by small types, or by bent wires, or in any other convenient way.

The blocks and slabs thus formed, with the subjects upon them, being secured in the chase, and fastened on the table of the printing press, as shown at fig. 2. Two sheets of paper are to be laid upon the tympan of the press, and enclosed by the frisket, in the usual way of holding sheets of paper in ordinary printing.

It will now be perceived, that when the blocks are inked, and the impression given to the paper, one of the sheets will be printed with lines only, and the other only with the notes; instead, therefore, of removing these sheets of paper from their situation between the tympan and frisket, and laying others in the same place, the sheets thus partially printed are allowed to remain for a second impression, the tympan being turned round upon its central pivot at *z*, which brings the sheet having the notes only into the former situation of the sheet having the lines, and the sheet with the lines into the former place of that with the notes: hence on inking the form again, and turning down the tympan with the paper, the second impression perfects the subject; the notes being now printed upon the sheet which had previously received the line, and

the lines upon the sheet which had previously received the notes.

The principal thing to be observed in this contrivance, is to place the form upon the table with great accuracy, so that the central pivot *z*, on which the tympan turns, shall be exactly opposite to the centre of the form, otherwise the two impressions will not register accurately together. But if this is properly attended to, the two impressions will perfectly correspond; and, when complete, the subject printed will be as correct as if taken at one impression from a single block or plate.—[*Inrolled Oct.* 1827.]

To PHILIP DERBYSHIRE, *of Ely Place, Holborn, in the county of Middlesex, Esq. for his invention of a certain Medicine or Embrocation to prevent or alleviate Sea Sickness, which may be usefully applied to other maladies.*—[Sealed 4th Dec. 1828.]

THE malady of nausea to which so many persons are subject at sea, produces such wretched and painful sensations for the time of its duration, that any remedy which could be conveniently applied, must be highly acceptable. We are not able, upon our own experience to speak of the success of the present invention, neither does it appear to us to promise so certain a a remedy or cure as the mechanical contrivance described in Mr. Pratt's Patent, given in the Thirteenth Volume of our First Series, page 117; but the means being simple and within every ones reach, it is desirable that it should be extensively known, and we hope will be found beneficial.

To prevent the possibility of mistake, we give the description of the materials employed, and the means of using them in the words of the inventor.

SPECIFICATION

"The nature of my said invention, and the manner in which the same is to be prepared, are described and ascertained as follows:—

"In its nature it is an embrocation for sea sickness; that is to say, in some cases for preventing sea sickness, in others for curing the person afflicted with sea sickness, and in others for mitigating the severity of sea sickness.

"The manner in which it is to be performed and applied, is as follows:—Take of *crude opium* two ounces avoirdupois; two drachms of *extract of henbane*; ten grains of powdered *mace*, and two ounces of *hard mottled soap*. Boil them in sixty ounces of soft water, letting it boil for half an hour, stirring it well all the time. When cold add one quart of *spirits of wine*, at sixty degrees above proof, and three drachms of *spirits of ammonia*.

"Rub a dessert spoonful of this embrocation well in over the lower end of the breast bone, and under the left ribs, the latest time you can conveniently do so previous to embarkation, and again on board as soon as you have an opportunity. If notwithstanding this you become sick, apply the embrocation as before, and continue the application while the sickness continues.

[*Inrolled in the Inrolment Office in Chancery, May,* 1829.]

Specification drawn by the Patentee.

To HENRY ROBINSON PALMER, *of the London Docks, in the county of Middlesex, Civil Engineer, for his invention of a certain improvement or improvements in the Construction of Warehouses, Sheds and other Buildings, intended for the Protection of Property.*—[Sealed 28th April, 1829.]

SPECIFICATION.

"MY improvement or improvements in the construction of the roofs and other parts of warehouses, sheds and

other buildings, intended for the protection of property, consists in the application of metallic plates or sheets, in a fluted, indented, or corrugated form, to the purposes in relation to buildings, for which metallic plates with even or plain surfaces, have been already applied. The advantage to be derived from the form or forms proposed consists in the additional strength obtained in the metal itself, so that less aid is required from frame work supporting or attached thereto, to preserve the plates in their proper form and position.

"Various forms of the flutings, indentations, or corrugations may be adopted, but I prefer the fluted, or that which is composed of curved or waving lines, as represented in section in Plate XI, fig. 3.

"The fluted sheets, or plates of metal, may be applied to roofs of buildings, to the sides of them, to the doors, the shutters, and to partitions in the buildings, whether moveable or stationary.

"The form of the flutings, and the manner of applying the fluted sheets or plates, may vary according to circumstances, and to the taste of those who require their use; I therefore shall confine my explanation of the manner of applying them to such examples only as are necessary for the illustration of the purposes intended by me.

"Fig. 4, represents four plates or sheets rivetted together. Fig. 5, represents the section of a roof, the two sides of which *a*, *a*, are composed of fluted plates or sheets. These plates are rivetted at their upper ends to a crown plate made in an angular form, and represented at *b*. The lower extremities of the fluted plates or sheets are rivetted, or otherwise connected with a gutter composed of metal, and formed as represented at *c*, *c*. The gutters rest on bearers commonly known by the name of gutter plates, which may bear on pillars or

any other usual supports most convenient. The horizontal thrust or pressure of the roof thus formed, may be resisted by any known means most conveniently applicable.

" The application of the fluted, indented or corrugated plates or sheets to the sides of buildings, or to partitions, or to doors or shutters, is best performed by rivetting or otherwise connecting the said sheets or plates to a frame made of wood, or any other substance that may be preferred, though a frame of the same metal as the plate is best adapted for the purpose.

" Fig. 6, represents a fluted sheet or plate inserted in a metallic frame, the section of which is angular, and represented by fig. 7. In this case the sheet or plate of metal is inserted within the recess of the frame, and rivetted to the flanch all round. The figs. 6, & 7, referred to, may be considered to represent the general mode of applying my improvement or improvements to the sides of buildings, to partitions, to doors, and to shutters.

" I do not claim as my invention any particular mode of forming the plates or sheets as herein described, the means of producing such forms being well known. Neither do I claim as my improvement or improvements any particular mode of connecting the fluted, indented or corrugated sheets or plates of metal together, or the mode of attaching them to buildings, so as to form a part or parts of such buildings; but I claim as my improvement or improvements the use or application of fluted, indented or corrugated metallic sheets or plates to the roofs and other parts of buildings, as hereinbefore described.

Inrolled in the Rolls Chapel Office, June, 1829.

Specification drawn by Mr. Newton.

To NATHAN GOUGH, *of Salford, in the county of Lancaster, Civil Engineer, for his having invented or found out an improved method of propelling Carriages or Vessels by Steam or other power.*—[Sealed 20th March, 1828.]

THIS invention professes to be a peculiar combination of mechanism for working a loco-motive carriage, by the power of steam. A great variety of parts are described, but the features of novelty particularly claimed appear to be the mode of connecting the running wheels to the rotatory parts of the engine; the apparatus for steering the carriage, and the construction of the valves for regulating the supply and discharge of the steam.

Plate XII, fig. 1, is a side view of the carriage; fig. 2, a view of the front, and fig. 3, a plan or horizontal view; the corresponding letters referring to similar parts in these three figures.

SPECIFICATION.

"Before I proceed to describe the nature of my improvements, which are used in my method of propelling carriages by steam or other power, I shall briefly state the method by which the power is applied for propelling the carriage, and the means by which it is guided or steered in its course;—*a*, represents an iron box, in which the engine is placed; and from a revolving shaft *l*, the power is carried by means of the chain *b*, to the hinder wheels, where every alternate loop of the chain corresponds with projections on the periphery of the wheel marked *c*. By means of this arrangement, the hinder wheels of the carriage are forced round in the direction of the arrow, and the carriage impelled onward.

"The superintendant, whose duty it is to steer or guide the carriage, is placed in the front, on the seat *d*, and it is

by means of the handles and the foot lever *v*, that he is enabled to turn the shaft *e*, on its centre.

"At the lower extremity of the shaft *e*, are firmly fixed the two arms *f*, *f*; and at the extremities of these two arms are connected rods *g*, which act on the two front wheels. The shaft *e*, also acts on the pointer in the front of the carriage, by which the superintendant is enabled to see the course he is steering more clearly.

"The front wheels of the carriage are not both placed on the same axletree, but revolve on separate ones, which are attached to the perpendicular column *h*; and it is on the centre of this column, which moves freely and is held perpendicularly by a spring, that the front wheels move in the directions required to guide the carriage.

"The advantage gained by this arrangement of the front wheels is the small power or force required to guide them; for it is obvious that the power required for placing the front wheels in any position, with regard to the movement of the carriage, must diminish in proportion to the distance of the centre round which it has to move; and in this instance it is decreased in the proportion its own centre bears to the centre of *h*, and to the centre *e*, which is the centre around which the front wheels of the carriages of the ordinary construction move, for the purpose of guiding them.

"The facility gained for moving the front wheels of a carriage of this construction, and thereby guiding its direction, will be more manifest by reference to fig. 2, where the dotted lines intersecting the front wheels of the carriage, represent a position in which those wheels might be placed, and in which position the arrangement of the apparatus for guiding them would move them on the centre *h*, and place them in any direction as regarded the

movement of the carriage, without their revolving round any centre excepting one common to their own.

"I shall now proceed to describe the construction of the engine for propelling. Fig. 4, represents a front view of the engine placed across the carriage in the box *a*; drawn on an enlarged scale; *i, i, i, i,* are cylinders vibrating on pivots; *k, k, k, k,* are their piston rods severally connected to cranks in the main axle *l.* The cranks are placed at right angles to each other, so that the two cylinders on the same shaft cannot be on their centres, or in a perpendicular position at the same time.

"The shaft *l,* on which the cranks are, is divided in the middle, so that the two cylinders on one side can be applied without interfering with the other two, and consequently the power of the steam can be applied to either two of the cylinders, as circumstances may require.

"This engine does not condense, and its power depends on the strength of the steam used for putting it in motion; *j,* is a steam chest or hollow passage, by means of which the steam is conveyed to the cylinders; and it is by means of a valve or cock *m,* that the steam is conveyed to the opposite sides of the piston, at each vibration of the cylinder.

"Steam being admitted to the upper part of the cylinder, the piston is in consequence forced down, and the connection of the piston rod with the crank causes the cylinder to vibrate; and it is this vibration which changes the course of the steam, and causes it to act on the opposite side of the piston, by means of the valve *m.*

"Steam is conveyed from the boiler to the engine by the pipe *n,* through the three way cock A, and from this cock it is conveyed by the pipe *o,* to a distributing cock B, to the cylinders of the engine. To the steam pipe *n,* is attached a pipe *p,* in which is inserted the safety valve; and

the atmospheric valve; *q*, is a pipe, by means of which the steam which is forced from the cylinder at the return of the stroke through the valve *m*, and steam chest *j*, is conducted away to what I call the heating chest behind, shown in section at fig. 5. Into this heating chest what steam may escape from the safety valve is also conducted.

" There is a vessel connected with the boiler, containing a float, by means of which the amount of water forced into the boiler by the pump *s*, is regulated. This pump is worked by a lever, which is acted upon by a cam or excentric, placed immediately beneath it on the shaft *l*. The box, containing the valves of the force pump, contains arrangements connected with the float for regulating the supply of water to the boiler.

" The wheels *c*, *c*, over which the chains *b*, *b*, pass, are placed loosely on the shaft *l*, and are connected thereto by coupling boxes. The shaft *v*, proceeds forward to the position in which the superintendant is placed, and is capable of being revolved by the two foot levers *v*; and it will be seen that by the connection of the shaft *v*, *v*, with the compound lever *u*, turning on a common centre, that any motion of the shaft *v*, must act on the connecting rods *w*, (one of which is shown by dots), and slide the clutch boxes *x*, *x*, and the wheels *c*, *c*, in and out of gear, with the crank shaft *l*.

" In the position shown in fig. 4, the wheel *c*, is connected with the shaft *l*; but by moving the foot lever *v*, the wheel *c*, would be disengaged from the shaft, and the engine no longer impart motion to it, or to the wheels of the carriage.

" By shifting one of the levers *v*, the connecting rods *w*, would be so acted upon, that the wheels *c*, might be thrown into gear either with the shaft *l*, for the ordinary propelling of the carriage, or with the wheel *y*, which

gives increased power at a slower speed, by means of a train of toothed gear. Thus in starting or going up hill, the superintendant is enabled, by the action of his foot on the lever *v*, to place the wheel *c*, on the slow speed of the engine; but when the work becomes lighter, or the carriage is proceeding on level ground, he is enabled, by a similar action, to shift the wheels *c*, and to work at the ordinary power and speed, or to disengage the connecting parts, and thereby to stop the progress of the carriage.

"In fig. 3, the platform with the back seat has been removed, to show the position of the water tank *z*, *z*, and the intermediate space, which is designed for coals."

The specification proceeds to describe a boiler and furnace, the flues of which are formed by tubes passing through the water; and the lower part of the boiler is divided by perpendicular partitions, for the purpose of preventing the water from flowing away and leaving any part of the boiler uncovered during the ascent or descent of the carriage over hilly ground.

There is also a provision for raising or lowering the chimney in case of need, which may be done by a rack and pinion turned by a winch. A variety of other parts of the carriage are also described, but as none of those parts appear to possess any novelty, we omit the description, and proceed to point out those particulars which the Patentee claims as new.

The first of these is the distributing cock B, shown at fig. 6, which is to be placed in the steam pipe, and according to the position of the plug, a greater or less quantity of the steam will be passed to the right or left, to the supply of the respective cylinders, and consequently the power exerted by the cylinders may by that means be varied. This cock is acted upon by the same train of

movements which guide the fore wheels, so that the superintendant regulates the supply.

The three way cock A, shown at fig. 7, is another feature claimed as new in its adaptation; this is for the passage of the steam from the boiler, and also for its exit from the cylinders. This cock is governed by a shaft, which is connected with the handles, under the direction of the superintendant. If it should be desired to stop the carriage suddenly, the cock must be turned, so that the steam should blow off, instead of passing through the cylinder.

The heating chamber or box, shown in section in fig. 5, is another feature considered to be new, and is constructed of sheet iron, divided into compartments; through this the steam passes from the condensor, and also from the escape of the safety valve. The water for the supply of the boiler is forced by the pump through the bent tube enclosed in this vessel, the effect of which is that the temperature of the water becomes considerably raised before it enters the boiler.

There is a float in the boiler connected with the water way of the pump, which as the water rises in the boiler, closes the supply valve, so that if the pump continues in action, no more water can be injected, but it will be returned through the cold water pipe.

The specification goes on to say, "I shall now proceed to state the manner in which these improvements may be applied to steam vessels, which would be effected by placing the paddle wheels on the shaft *l*, in the same situation as the wheels *c*; and by the application of the cock B, the steam might be distributed at pleasure to the engine connected to the paddle wheels at either side of the vessel, and thereby aid in steering or directing the course of the vessel, and obviate the necessity of using the rudder, which in all cases must more or less impede the progress

of the vessel; and with the addition of two valves of the common kind, the paddle wheels might be made to turn in opposite directions, and thereby turn the vessel on her centre; a circumstance which cannot be accomplished by the rudder now in use; and also by the application of the adjusting cock to the force pump described; the power required for supplying the boiler with water will be much diminished."

These contrivances, and also the mode of applying the power to the wheels, by means of chains, constitute the subjects of invention claimed under this Patent.

Inrolled in the Inrolment Office in Chancery, Sept. 1828.

Specification drawn by Mr. Nicholson.

To James Moore Ross, *of Symond's Inn, in the county of Middlesex, Ironmonger, for his having invented an improved Tap or Cock for drawing off Liquids.*—[Sealed 19th Jan. 1829.]

SPECIFICATION.

My invention of an improved tap or cock for drawing off liquors, consists in a method of tightening the play of the cock by means of a helical spring coiled round the stem, which brings together two parallel plates properly ground and fitted, so as to form a perfectly air and water tight joint. One of these parallel plates is fixed, the other moveable, and they have each corresponding apertures through them, which, when brought into coincidence, allows the liquor to flow; but when the moveable plate is turned round, the apertures become closed by the solid parts of the plates covering the apertures in each other. Plate XI, fig. 8, is an external view of the cock, with

the improvement adapted. Fig. 9, is a section of the same, taken longitudinally. Fig. 10, is a horizontal section of the same; *a*, is the barrel of the cock; *b*, the well or discharge part; *c*, the stem of the plug *d, d*, the moveable parallel plate affixed to the stem of the plug, in which are two apertures for the passage of liquor; *e, e*, the fixed parallel plate, forming a continuation of the barrel, this plate having similar apertures, as seen best in fig. 10; the moveable plate below, with its apertures, being shown by dots. Fig. 11, is a representation of the moveable plate *d*, as seen on the top side, and fig. 12, is the plug or stem, and discharge part detached from the cock.

After inserting the stem or plug into its socket, as shown at fig. 9, the helical spring, fig. 13, is placed over it with a washer bearing against a shoulder on the neck of the barrel. Upon the square part at the top of the plug, the cross lever or handle is fitted, and is held down by a small screw, inserted into the end of the stem, which presses the helical spring into tension, and by the reaction of this spring the moveable plate *d*, is drawn up, and held in close contact with the fixed plate *e*.

By raising or lowering the screw, the force of the spring will be diminished or increased, and hence the junction of the plates be rendered more or less tight, which prevents the possibility of leakage even by wear.

On turning the lever or handle, the moveable plate *d*, is slidden round, and the apertures brought into coincidence for the discharge of liquor; on turning the lever back again, the solid parts of the plates are made to cover the apertures, and the passage for the flow of the liquor becomes closed.

In the accompanying drawing I have shown but one of the forms in which I construct my improved taps or cocks for drawing off liquids; it must, however, be obvious that the improvement is applicable to various other forms. I wish it therefore to be understood, that I disclaim all pretensions of invention as to the forms of taps or cocks for drawing off

liquids, and limit my claim of improvement solely to the adaptation of two parallel plates or surfaces, with coinciding apertures for the passage of liquids, the surface of one plate sliding upon the surface of the other plate; whether those surfaces be truly flat, or the one concave and the other convex; and the adaptation of a spring to keep the two parallel surfaces in contact.

[*Inrolled in the Inrolment Office in Chancery, Mar.* 1829.]

Specification drawn by Mr. Newton.

To ROBERT STIRLING, *Clerk Minister of Galston, in Ayrshire, North Britain, and* JAMES STIRLING, *of Glasgow, Engineer, for their having invented or found out certain improvements in Air Engines for moving machinery.*—[Sealed Feb. 1, 1827.]

THIS is an engine constructed in the same way as an ordinary steam engine, with a piston working up and down in a cylinder, from the reciprocating action of which power is intended to be obtained for giving motion to other machinery. Instead, however, of employing steam acting against a vacuum, as the agent for moving the piston, it is proposed in the present instance to employ volumes of hot and cold air; the dissimilar elastic forces of which applied alternately on opposite sides of the piston, raise and depress it.

The volumes of air by which the engine is to be worked are contained in two vessels placed near the engine, from each of which vessels there is a pipe leading to the cylinder; the one delivering the air above the piston, the other below it. The piston therefore is worked by forcing into the cylinder one of the volumes of air, while the other is allowed to escape out of

it; and the mechanical force of the air is increased by heating the injected volume, and cooling that volume which is withdrawn.

To effect these objects, two distinct hemispherical or dome shaped furnaces are constructed, above each of which there is a corresponding hemispherical or dome shaped chamber, with cylindrical sides, containing the volume of air intended to be employed as the motive agent, and in each of the said chambers there is a piston, also hemispherically formed, exactly fitting the sides of the chamber, and working up and down therein for the purpose of expelling the air from the chamber into the cylinder of the engine.

The pistons of the two air chambers are to be raised and depressed alternately by a vibrating beam connected to the ends of their rods, which beam is to be actuated by some of the moving parts of the engine when set to work. The fires which are intended to burn with a uniform heat in the furnaces under each chamber, are for the purpose of causing the volume of air beneath each of the pistons to be heated, and of course its elastic force to be increased: while the volume above the piston becomes cooled by a blast of cold air, or a stream of cold water passed over the top of the chamber.

Depressing the piston in either of the air chambers, causes part of the volume of heated air beneath it to be forced through its pipe into the cylinder of the engine, and then to drive the piston by its elastic force, which act causes at the same time the piston in the other air chamber to rise, and thereby to draw off through its pipe the volume of air from the opposite side of the working piston.

The peculiar feature of novelty in this apparatus appears to be the construction of the pistons in the air chambers, by means of which a rapid change of temperature is effected in the air from hot to cold, and *vise versa*.

The air pistons formed as before said into hemespherical shapes, are to be several inches in thickness, and constituted of

several plates of metal with multitudes of small perforations in them. The plates are to be kept a little distance apart, either by indenting them, or by introducing small pieces of hard substances between the plates, and the whole of them being secured together constitute a colander, through which the air percolates with difficulty.

In the descent of either of the pistons, that part of the heated air which is not forced into the cylinder of the engine, passes upwards through the small holes of the piston, and becomes cooled by being brought in contact with the surface of the cold part of the air chamber, and the piston in rising again allows the air thus rendered cold to pass from the upper part of the chamber through the perforations of the piston to assist in cooling that portion of the volume of air which is being withdrawn from the cylinder.

In this way it is proposed alternately to change the temperature of the air in the two chambers with great rapidity, and taking advantage of the superior mechanical force of the air when heated, to employ it in driving the working piston of the engine.—[*Inrolled August,* 1827.]

To Granville Sharpe Pattison, *of Old Burlington Street, in the city of Westminster and county of Middlesex, Esq. in consequence of a communication made to him from a Foreigner residing abroad, of a new and improved method of applying Iron in the sheathing of Ships and other Vessels; and of applying iron bolts, spikes, nails, pintals, braces and other fastenings used in the constructian of ships and other vessels.* [Sealed 4th September, 1828.

It has been for some time known to the philosophical world that iron alloyed by a small portion of zinc, will be preserved from oxydation. This principle is now proposed

to be applied to the preservation of ships' bottoms, sheathed and bolted with iron; and it appears to have been proved by the most satisfactory experiments, that a small piece of zinc, placed in contact with iron, will so far attract the oxygen as to preserve the iron perfectly free from rust for any length of time; that is, until the zinc is destroyed or eaten up by the corrosion; at the same time the iron, if polished, preserves its brightness under every exposure to damp, and even to the action of sea water.

We give the explanation of the mode of applying this discovery in the words of the Patentee.

SPECIFICATION.

"The new and improved method of applying iron in the sheathing of ships and other vessels, and of applying iron bolts, spikes, nails, pintals, braces and other fastenings used in the construction of ships and other vessels, consists in the applying iron in the above cases, in such a way, and by such means, as to prevent in a great measure, if not entirely, the corrosion, rusting, or oxydation of the same, and it is effected by the following processes, that is to say,

"*First, Of the iron sheating.*—It is desirable before the iron sheathing is applied, that the bottom of the vessel should, as is usual, be well payed or coated with tar, over which paper or felt is attached. The iron sheets should be of the size of the copper sheets commonly used for this purpose.

"In applying the iron for sheathing vessels there must be attached to each sheet by soldering, rivetting, or otherwise, zinc plates, the sum of the areas of which, should bear to that of the iron sheet, about the proportion of 5 to 100, but this precise proportion is not essential. It will be

convenient to have the zinc plates from half to a whole inch in width, and about one-eighth of an inch in thickness. It is essential that zinc plates (or zinc in some form or other), should be attached to both sides of the iron sheet.

"The area of the zinc plates, attached to the outside of the iron sheets, should be larger than that of the zinc plates attached to the inside, at least this is desirable, and the proportion of three to two will be found convenient.

"The smoothest side of the iron sheet should be selected for the outside, and the zinc plates to be attached to this surface should be rivetted or soldered near that edge of the sheet, which, when attached to the vessel, will constitute its lowest edge.

"The zinc plates that are to be attached to the under surface of the sheet, may be placed on any part thereof. The following arrangement of the zinc plates will be found sufficiently convenient. See Plate XI.

Supposing *a*, and *b*, fig. 17, to represent the form of the iron sheet area 100 square inches, let *c*, *d*, be the zinc plates attached to the outer surface, the area of which amounts to three square inches, and *e*, *f*, the zinc plates attached to the inner surface (shown by dots), the area of which amounts to two square inches.

"When the sheet is attached to the bottom of the vessel, there should be a number of perforations through the zinc plates and iron sheets suitable for receiving nails.—The iron sheets should likewise in other convenient parts as are usual in common sheathing be punched, but in this case care must be taken to punch the iron sheets with small holes, barely sufficient to allow the nails to pass through them: so that they may thereby come into intimate contact with the iron sheets.

"These nails should have well formed heads. It is im-

portant that there should be the most intimate contact possible between the iron sheet and iron nails, so that the influence of the zinc plates may also extend from the iron sheet to all the iron nails.

"As in the arrangement of the sheathing, it is considered best, that the lower sheets should lap over those directly above, it will be convenient in applying the sheets to the vessel, to begin with the upper streak or row of sheets, and proceed downwards towards the keel.

"If the first row of sheets, proceeding in this manner, be arranged as in the figures, then the upper end of the second will lap over the zinc plates *c, d,* which will be thus secured from the direct action of the sea water.

"In nailing on the sheets particular care should be taken that nails be driven through those holes or perforations in the zinc plates and iron sheets into the bottom of the vessel.

"The zinc plates and iron sheets should be secured in intimate contact by rivetting or soldering; this, however, may be effected by nailing, or any other manner by which intimate metallic contact may be permanently effected; but the above described processes are considered the best. The more intimate such contact is, the more perfect will be the protection.

"Any other arrangement of the zinc plates upon the iron sheets will answer, provided they are secured in intimate contact; and a portion of the zinc plates applied to both surfaces of the iron sheets. But the arrangement as described is considered the most convenient.

"*Secondly. Of the Iron Bolts.*—Those bolts which are buried in the wood, the head alone being exposed to the sea water, are to be protected by placing beneath the head of the bolt a plate or flat ring of zinc.

"The bolt should have a broad well formed head, the

plate or flat ring of zinc should be about the form and size of the head of the bolt. But this precise form and size are not absolutely essential, provided the area of the zinc plate or flat ring be to that of the surface of the whole bolt about as 5 to 100.

"The plate of zinc should be from about one-eighth to one-fourth of an inch in thickness, with a hole perforated in its centre, so as to form a flat ring, or washer, or burr, as it is sometimes called, and slipped over the shaft or shank of the bolt, so that when it is driven well home, the zinc plate will be in intimate contact with the under surface of the head of the bolt.

"The contact between the zinc plate and iron bolt should be as complete as possible, to secure which the under part of the head of the bolt should be freed from rust, dirt, and foreign matter, and the bolt be driven well home.

"Those bolts which penetrate through the sides of the vessel, will be more completely preserved by placing plates or washers of zinc (in addition to those under the heads of the bolts), over the inner ends of the bolts, and securing them by nuts of iron rivetted, screwed, or clenched, so that complete contact exists between the nuts and zinc plates.

"*Thirdly. Of the iron spikes.*—Iron spikes are protected by means of washers or plates of zinc, in a manner similar to that described in speaking of bolts. The proportion between the surface of the plate of zinc and that of the spike, should be as above described. The heads of the spikes should be larger and better formed than those usually employed at present in ship building; the spikes should be driven well home, so that their heads may be in contact with the zinc plates.

"Whenever bolts or spikes are placed in those parts of

the vessel where they are constantly or even occasionally immersed in the sea, the plank or other wood, should be countersunk or excavated, so as to admit the heads of the bolts or spikes below the external surface of the plank or other wood. Wooden plugs should then be driven tightly in over the head of the bolt or spike, by which the free access of the sea water to the zinc plate, will be in some measure prevented.

"When so great an excavation would weaken the plank or other wood too much, the object may be obtained by having the head of the bolt or spike concave underneath, so that when it is driven home, the edges of the head of the bolt or spike will be driven into the wood, so as to exclude sufficiently the access of the sea water to the zinc plates.

"It is not the object of this arrangement to exclude entirely the access of the sea water, this is neither desirable nor practicable, humidity being indispensable to the protecting influence of the zinc plates upon the iron bolts or spikes. The object is, as far as possible, to place the bolt or spike under similar circumstances as when immersed in small quantities of sea water. This arrangement is not indispensable, but will be found beneficial in imparting durability to the work.

"*Fourthly. Of the iron nails.*—The iron nails used as fastenings in ships and other vessels, will be sufficiently protected by having their heads made larger than usual, of a circular form, and concave underneath, into which cavity melted zinc may be poured, or in which a plate or flat ring of zinc of a suitable size and thickness, may be placed, and the nail driven well home; the edges of the head of the nail will be driven into the wood, and thus serve sufficiently to protect the zinc plate from the free access of the sea water.

"*Fifthly. Of the rudder braces and pintals.*—Zinc plates

from a quarter to a half of an inch in thickness, or thereabouts, the area of which bears to that of the surface of the rudder braces about the proportion of 5 to 100, are to be secured by rivetting or soldering, or in any other manner which will secure intimate metallic contact to each pintal and brace.

"It is proper that a part of the zinc plates should be secured on each shank, and in a proportion to both the inner and outer surfaces of the rudder braces and pintals. Perforations should be made through the zinc plates and rudder braces and pintals.

"After the rudder braces and pintals have been secured in the usual manner to the vessel and rudder, small spikes or large nails should then be driven through the above named perforations, into the wood of the vessel and rudder.

"It is highly desirable that the bolts, spikes, or other fastenings, by which the rudder braces and pintals are secured to the rudder and vessel, should fit closely into the holes they are intended to occupy, so that when they are driven home, they shall be in as close contact as possible with the rudder braces and pintals. Unless this is carefully attended to, the preserving influence of the zinc plates will not extend so perfectly from the rudder braces and pintals to these fastenings; and the bolts or spikes used for securing the pintals and braces to the rudder and vessel, may pass through the zinc plates.

"It should be observed, that though in this specification the proportions of zinc and iron to be used are stated to be about as 5 to 100 for preserving the iron fastenings and sheathing of ships and other vessels, yet it is not indispensable that so large a portion of zinc should be used, and a larger proportion than 5 to 100, may be adopted if desired.

" In all the instances mentioned in this specification, where zinc plates or sheets are used for preventing the oxydation or rusting of the iron fastenings and sheathing of ships and other vessels, zinc alloyed, mixed or compounded with small portions of other metals, especially copper, tin and lead, may be substituted for the pure zinc. The most suitable proportions of such other metals to that of the zinc, will vary from three to ten per cent.

" In this specification, plates, sheets, and washers of zinc, of various forms and thicknesses, have been mentioned, it should, however, be observed, that these particular forms and thicknesses are not indispensable, but only such as have been found most convenient in effecting the different objects of this invention.

" The zinc should be closely connected with both sides of the iron sheet. Nails should be driven through the perforations in the zinc plates and iron sheets, into the bottom of the vessel, and the other holes with which the sheet is perforated should be barely large enough to allow the nails to pass.

" *Lastly*—Be it observed, that the invention as to the iron sheathing, consists in the combination of the iron sheets with the zinc plates, or zinc in some other form, attached on both sides thereof; and the application of the iron sheets so combined for the sheathing of ships and other vessels, so that thereby the corrosion of such sheathing, which otherwise would arise from its immersion in sea water, is, in a great measure, if not entirely, prevented.

" And as to the iron bolts, iron spikes, and iron nails, used in the fastenings of ships and other vessels, the invention consists in the said combination of the same, with the zinc washers, plates, or flat rings, and in applying the same, when so combined, to the purpose of such fastenings

of ships or other vessels, so as thereby to prevent in a great measure, if not entirely, the corrosion which otherwise would arise from their immersion in sea water."

Inrolled in the Inrolment Office in Chancery, March, 1829.

To William Marshall, *of Fountain Grove, in the Parish of Huddersfield, in the county of York, Shear Manufacturer, for his invention of improvements in machinery for cutting or shearing, cropping and finishing Cloths, and other articles manufactured from wool or other raw materials.*—[Sealed 26th April, 1828.]

This machine for shearing the pile from woollen cloth, does not appear to possess a single feature of novelty; it consists of the following parts, see Plate XII. Fig. 8, is a side view drawn geometrically; *a, a, a,* is the standard or frame work which supports the actuating wheels, with a railway at bottom, on which the carriage *b, b,* traverses. This carriage holds the cloth *c,* tightly distended, and by traversing along carries it under the cutter *d,* to be shorn.

The cutter is constituted by two blades, the one a fixed straight edge of steel, called the ledger blade, laying upon the face of the cloth, the cloth being kept up to the edge of the cutter by a roller beneath, as a bed; and the other part of the cutter is a steel blade wound round a cylinder, which being made to vibrate by a crank movement, from the axle of the actuating rigger *e,* moves against the fixed blade, and operates like shears. The rigger may be driven by hand, or steam power, or otherwise.

The carriage with the cloth is conducted forward under the cutters by means of toothed wheels *f,* one of which

works in a rack g, g; these wheels being driven by bands or gear communicating with the shaft of the rigger. The operation of the cutter on the cloth ceases when the list on its edge arrives at the cutter, by a stop h, pushing back the catches which hold the cutter frame i, when it instantly raises the cutter off the cloth; and when this takes place, the pile having been cropped from the face of that portion of the cloth under operation, the handle or winch k, is to be turned for the purpose of rolling the cloth on the beam l, and bringing another portion of its surface up for a similar operation.

It is perfectly unnecessary for us to give a more particular description of this machine, as it is an exact facsimile, in principle, form, and operation, of one described in the Seventh Vol. of our First Series, page 281, and Plate XV, in the Specification of a Patent granted to Thomas Miles, of Dudbridge, near Stroud, Gloucestershire.

As it may, however, be desirable to ascertain what are the claims of the present inventor, we give the concluding paragraph of his specification, which is in these words :—

"Having described my improvements for cutting or shearing, cropping and finishing cloth and other articles manufactured from wool or other raw materials, I shall conclude by stating, I do not claim any separate or well known parts or portions of such machinery, but I claim such arrangement or combination of parts as are hereinbefore described, and likewise such obvious modifications of my machine, as converting the vibrating motion of the cutter into a rotatory motion; the attaching of an additional connecting rod to the excentric by means of which another set of similar knives may be worked, and thereby constitute a double machine; and also that modification by which the cloth or fabric would be submitted

to the action of the knives, in a direction from end to end instead of crosswise, as in the machine above described. All these being variations that I have already tried, and approve of, but are too obvious to require a minute description.

"And lastly, I do declare, that the speed of the various parts of my machinery hereinbefore described, as well as the means of producing the various movements, may be modified and varied by the substitution of other well known movements, those which I have used; all which variations and modifications, together with the proportions of the different parts, as well as the materials to be used in constructing those parts, must depend upon the nature of the work for which the machine may be required, and which may be attained with facility by any person of competent skill, and fit to be trusted with the construction and direction of machinery of this and a like description.—[*Inrolled June,* 1829.]

To James Andrew Hunt Grubbe, *of Stanton St. Bernard, in the county of Wilts, Clerk, for his having invented a Transmitting Heat Wall, for the ripening of Fruit.*—[Sealed 9th January, 1828.]

The intention of the Patentee is to erect thin partitions in gardens as substitutes for walls, against which fruit trees may be trained, and through which the warmth of the sun may, by reason of their thinness, be transmitted, which will greatly promote the ripening of the fruit and improve its flavour.

The material proposed to be employed for constructing these walls or partitions, is slate of the ordinary quality, in

slabs of the kind usually applied to the roofing of houses. Iron frames are proposed to be prepared for the reception of the slates, like the frames of windows, and the slates being cut to proper shapes and dimensions, may be secured in the rebates of the frame, by putty in the same way as glass.

These frames are to be from six to eight feet wide, and of a suitable height, and may be joined together side by side by rebates or flanges, and held fast by screws, bolts, pins or staples, or in any way that may be found desirable to secure them firmly.

Temporary blocks of stone may be placed along the ground to support the partitions, with cross pieces to receive standards or slight buttresses, to keep the wall or partition perpendicular; and against the face of the wall trellis work of wood, or other fit material may be placed, for the support of the branches of the trees, and to enable vines to entwine their branches round.

Walls or partitions for gardens formed in this way, will transmit the heat of the sun through them; and hence fruit, which may be growing against these walls having a northern aspect, will receive the benefit of the sun's warmth transmitted through the slates.

In the construction of these transmitting walls, the patentee does not confine himself to slate, but considers that plates of iron applied in the same way might answer the purpose nearly as well, provided that their surfaces were blackened, which would cause them to absorb more of the solar rays. Even panes of glass might answer the purpose applied, in the same manner, and perhaps some other materials might do; but it is desirable that the frames should be light enough to admit of their being removed without difficulty, in order that these partitions may be shifted from place to place, and set up in different parts of the garden, as convenience may dictate.—[*Inrolled July*, 1828.]

To JAMES STOKES, *of Cornhill, in the city of London, Merchant, for his invention of certain improvements in making, boiling, clarifying or preparing raw, or Muscovado, Bastard Sugar, and Molasses.*—[Sealed 11th Oct. 1827.]

THE object of this invention is to prepare sugar from the cane juice or molasses, of a superior quality to that obtained by the ordinary process.

The juice, say one hundred gallons, being placed in a suitable vessel for clarification, add to it fourteen pounds of charcoal in a pulverized state; seven pounds of the bark of the wild elm, and one pound of lime. Mix them well together, and when settled, skim off the foul matter from the surface. Then filter the liquor through a blanket, as usual, and afterwards boil and evaporate it to a state of crystallization.

When the sugar has become cold, mix with one hundred weight of it, one gallon of brandy, rum, gin or other spirituous liquor, and then, by hydraulic pressure, or any other means, express the molasses, which renders it fit to be put into moulds, or into casks for the market.

In adapting part of this improved process to the clarification of bastard or brown sugar, mix with the sugar spirituous liquor in the above proportions, and press out the molasses as above described.—[*Inrolled April*, 1828.]

The Patentee does not point out what part of this process he considers to be new; and for our part, we are unable to discover the novelty, as several of the materials mentioned, and the mode of applying them, have, if we mistake not, been long in use for the same purpose.

EDITOR.

To WILLIAM ALEXIS JARRIN, *of New Bond Street, in the county of Middlesex, Italian Confectioner, for his invention of certain improvements in apparatus for cooling Liquids.*—[Sealed 13th August, 1827.]

THE subject of this Patent is simply a vessel intended to be filled with ice, which is to be placed within a pan or vase containing the liquid about to be refrigerated. The form of the ice vessel is described as cylindrical, and of the same height as the outer vessel, but its precise dimensions do not appear to be of importance, and the outer or containing vessel may be of any shape agreeable to taste, and formed of china or other suitable material.

The ice vessel is to be placed in the middle of the vase, and immersed in the liquor required to be cooled; by which contrivance the caloric of fluidity may be extracted from the water, cream, or other liquor contained in the vase, and be frozen in a short time.

We have no idea in what the novelty of this apparatus is supposed to consist, no novelty is professed, and nothing more is perhaps intended, than to produce a tasty and convenient apparatus for the luxury of freezing liquids in warm weather on the table after dinner, and by way of giving importance to the apparatus, dignifying it with the title of Patent.

[*Inrolled October*, 1827.]

To THOMAS ADAMS, *of Oldbury, in, the county of Salop, Manufacturer, for his invention of certain improvements on instruments, or apparatus for the Relief or Cure of Hernia or Rupture.*—[Sealed 6th May, 1828.]

THIS instrument, three forms of which are represented in Plate XI, is applicable to inguinal, femoral, umbilical and

ventral ruptures, and although it differs but little in external appearance from many of those commonly employed; it is said to have been found greatly to surpass all others in the safety and ease which it affords to those who use it.

It may be proper to observe, that in all cases of rupture, it is of the greatest importance to regulate the pressure of the truss, according to the sensibility of the skin, the situation of the hernia, the strength and the avocations of the patient, &c. A pressure which would be sufficient to prevent the protusion of a hernia when the body is at rest, or undergoing moderate exercise, might be insufficient for this purpose during any extraordinary exertion.

A gentleman who is ruptured, requires the bearing of his truss to be much stronger when he is exerting himself, as in hunting, than when he is quiet, or walking gently. A labourer stands in need of much more support during the fatigues of the day, than in his hours of rest and relaxation. Hence it appears that a truss should be so constructed that its operations might be made to vary, not only according to the situation of the hernia, but also according to the varying circumstances under which the body of the patient might happen to be placed; for that degree of pressure which would be necessary under violent exertion, would become painful if always continued; and on the contrary, that degree of support which would be safe, and at the same time easy and comfortable at other periods, would afford inadequate security when the body is subjected to the performance of any laborious exercise.

The power of varying the pressure of a truss with facility, so as to render its operation effectual under all circumstances, is an advantage which has been long looked for, but the Patentee says has been never adequately obtained before the introduction of the present instrument.

"By means of the slide spring, now for the first time employed, the pressure of this truss may at any time be increased or diminished by the patient himself, in a moment, without

his being under the necessity of removing the truss from his body, or even rising from his seat."

The spring which gives pressure to the pad is a flat piece of steel, bent round to the curved form of the body, and enclosed within the bandage, where it is enabled to slide, and is drawn forward or backward by the straps *a*, and *b*, which are affixed to its extremities.

In order to give any required pressure with certainty, the faces of the straps *a*, are marked with graduations answering to pounds weight, by which the various pressures of the truss are accurately shown.

The pressure, when once adjusted, will not of itself vary, but if found too great, it may be instantly diminished by merely drawing the graduated end of the strap, marked *a*, towards the pad; and on the contrary, its pressure is regained or increased, by drawing the other end of the strap marked *b*, from the pad. The different figures upon the graduated strap, as they appear on its being drawn from under the covering of the truss, indicate the precise weight of pressure applied.

The single truss, fig. 14, has one slide spring, but the double and umbilical trusses have two such springs, as may be seen by reference to figures 15 and 16.

The truss, fig. 16, when applied for inguinal or femoral hernia, should be placed about three inches below the hips, and if required to be made longer or shorter (in case the pad should not press exactly on the part desired), it may be easily done by taking out the small screw near the pad, and placing it in another hole in the moveable end.—[*Inrolled November*, 1828.]

These trusses are sold in London by Mr. Reed, of Regent Circus, Piccadilly.

To Baron Charles Wetterstedt, *of Commercial Place, Commercial Road, in the county of Middlesex, for his invention of a Liquid or Composition for water proofing or strengthening Leather.*—[Sealed 4th June, 1828.]

This composition for rendering leather water proof, is proposed to be made of the following materials:—

Of rosin take sixteen pounds, and of tallow five pounds, which are to be boiled together in one gallon of linseed oil until the rosin is perfectly dissolved, and mixed with the tallow and oil; to this add one and a half pounds of spirits of turpentine, in which has been previously dissolved about an ounce and a half of caoutchouc, commonly called Indian rubber.

This composition is suited for rubbing into the soles of boots and shoes, and will render them perfectly water proof; but for the upper leathers of such articles, and for harness and other leather the following composition is proposed:—

Take of neatsfoot oil one gallon, of tallow six pounds, of hogs lard eleven pounds, and of bees wax half a pound; which being boiled together until perfectly mixed, must be allowed to cool, and after its having become cold, add to the composition three pounds of spirits of turpentine, in which three ounces of caoutchouc (Indian rubber) has been dissolved.—[*Inrolled December*, 1828.]

The Patentee has not stated what he claims as new in this composition. Our opinion is, that every one of the articles mentioned have been either applied to render leather water proof, or to form water proof substitutes for leather.

Editor.

Novel Inventions.

1829.

Propelling Vessels.

Among the great variety of improved plans for propelling vessels which have recently become the subjects of Patents, a contrivance proposed by Mr. Perkins, the engineer, is remarkable for its simplicity.

The disadvantages attendant upon the ordinary propelling wheels, from the circumstance of the broad face of their paddles pressing on the surface of the water in entering, and lifting the water, in rising out of it, are obviated by passing the paddles into the water sideways giving the propelling stroke direct, and passing out of the water sideways also. The specification is not yet inrolled, but the invention consists in the two following particulars. First, the peculiar positions in which the paddle surfaces of the propelling wheels are placed, viz. in radial directions round the periphery of the wheel, and parallel to each other, but crossing the radial plains of the axis in angles of about forty-five degrees. Secondly, in placing the shaft or axle of the paddle wheel at an angle of about forty-five degrees from the direction of the keel or the side of the vessel.

The object of so arranging the angles of the paddles and the paddle wheel shaft, as respects their rotative positions to each other, and to the keel of the vessel to which they are to be applied, is for the purpose of introducing the paddle into the water edgewise, and after giving *a direct propelling stroke with the surface of the paddle at right angles to the keel,* to pass it out of the water in a similar way.

By placing the paddles in the oblique positions described, it will be perceived that the two paddles which stand at opposite points of the periphery of the wheel will have their faces situate at right angles to each other, the upper paddle always being in a line with the keel, that is edgewise, and the lower or operating paddle being at right angles to the keel; and a direct stroke of the paddle in the water in the line of the keel will be the result of this arrangement.

It certainly cannot be said that the paddles of this wheel will give as long a stroke through the water as some other constructions of wheels, in which the paddles turn upon their axles, but the circumstance of the paddles being firmly fixed, and the parts of the wheel being subject to no other movement but that upon its common axle, are advantages which at sea would perhaps recommend the present plan of Mr. Perkins before all others.

Vazie's Corn Preserver.

Our attention has been called to the great loss sustained both in the quantity and quality of corn grown in Great Britain, by the uncertain and often times tempestuous state of the weather in this island during autumn, and which the existing system of drying and gathering in that article is inadequate to guard against. This fact being notorious, renders any improvement in harvesting interesting both to the farmer and the community at large; we therefore readily admit that the introduction of a plan calculated to remedy the evil, is highly desirable.

The improvement proposed by Mr. Vazie to effect this object, described in the specification of his patent, given in our last (page 193), as far as respects the stacking of

corn, appears to have merit, and deserves trial, as by its adoption it appears probable that the corn will be effectually preserved from injury *by rain or wind, with little or no extra expense or trouble,* from the time of reaping until it is in proper condition to be housed.

The plan of inverting (a large sheaf at top like an umbrella) is simple, and we have no doubt will be found advantageous; and if so, there is reason for presuming that its general adoption may encourage the growth of corn in this country, and prevent the necessity of importing it from abroad; and by that means afford more extensive employment to the agricultural part of the community.

AMERICAN PATENTS

FROM THE FRANKLIN JOURNAL.

An improvement in the Machine for Picking Cotton; by James Pinell, and Aber Maxson, Barboursville, Cabell county, Virginia, October 10, 1828.

THE object proposed is, to turn the ordinary machine for picking cotton, by means of the foot applied on a treadle, exactly in the manner of the common turning lathe, and thus to substitute the power of men for that of horses.

The brushes used to remove the cotton from the saws are not attached immediately to the shaft, there being "two or more steel springs, fastened at one end to the stock of the brush, and at the other to the revolving shaft; the effect of which is, to admit of a vibration, which frees the brushes from the cotton, without the trouble of cleaning them."

What is claimed, "is the application of the crank, the treadle, and the fly wheel, so as to turn the same by means of the foot; and the use of the spring at the backs of the brushes."

For the use of Pine Resin as an article of Fuel for the purpose of Heating Ovens for the Baking of Bread, Bread Stuffs, Meats, and such other articles of Food as may be best cooked by baking; also for the purpose of heating hatters' kettles, used in the manufacturing and colouring hats; by Richard L. Wood, Philadelphia, October 10, 1828.

THE following is the specification:—

"The manner of using the resin, is to break it in small pieces, and ignite a sufficient quantity at the entrance of the flues, so constructed as to pass around and over the top of the ovens used for baking, and under and around the kettles used by hatters; adding a sufficient quantity, from time to time, to produce the required heat."

Remarks.—The foregoing, it is presumed, was suggested by the employment of rosin in Dr. Dyott's glass house, which fact was known in Philadelphia. Although the patents were issued on the same day, the application for that for fusing glass was antecedent to that of Mr. Wood. The purposes for which rosin is proposed to be used by each differ specifically, and were not, therefore, considered as interfering applications. If the respective patentees can sustain their claim to the use of rosin, it must of course, be limited to the precise uses named by them.

A machine for Thrashing Grain, denominated the "American Thrasher;" by John W. Poe, of Philadelphia, and John Ryan, of New Baltimore, Virginia, October 10, 1828.

IN this machine there are to be two feeding rollers, into which spikes or teeth, formed of wire, are to be driven: the gudgeons of the upper roller work in a groove, to admit of its rising and falling with the varying thickness of the straw in feeding. The beating cylinder has two or more strips of wood, running its whole length, and armed

with strips of iron on the edges which beat out the grain; there are teeth in one or more rows, set along these strips, and behind the beating edges, for the purpose of combing in between the straws, and of thus obviating the difficulties which arise from the beaters consisting of a straight edge only. The patentees propose sometimes to omit the feeding rollers, and to substitute an arrangement of slightly projecting spikes in a straight feeding-board. Some other modifications are mentioned, as may be seen by the claim, which is, "the addition of spikes upon the beating strip attached to the cylinder, with the spikes standing back, and projecting beyond the strips; the application of two of the above beating cylinders, and the omission of the curb; the omission of the feeding rollers and the curb, by the application of one of the beating cylinders, and an arrangement of spikes immediately under the cylinder, in a straight feeding-board."

An improved Machine for Cutting Rags for the Manufacture of Paper. by Moses Y. Beach, Springfield, Mass., Oct. 1, 1828.

THIS machine bears a strong resemblance to some of those used for cutting straw. There is a heavy fly-wheel turning on a stout iron shaft, the gudgeons of which rest on a strong frame; two or more arms project at right angles from the shaft of the wheel, and carry knives, or cutters; on the edge of the frame a cutter is firmly fixed, so that the others, in their revolution, pass it, and cut like the blades of shears. There is a feeding cloth passing round rollers, like that in the carding machine; upon this cloth the rags are placed, and carried by proper gearing between the cutters. By altering the gearing, the rags may be cut more or less fine, as they may be wanted.

"The inventor claims as new, the use and application of this machine for cutting rags for the manufacture of paper, by means of improvements adapting it to that use; consisting in extending the horizontal shaft through the axis, so that each end of it rests in the strong frame, thereby giving stability and uniformity to the motion of the knives; also in the increased power derived from increasing the weight and dimensions of the wheels and arms, beyond what has heretofore been used or known for any similar operations. Also in the use of the arms, one or more proceeding from the horizontal shaft, and attached to the balance wheel, or placed at a distance from it, as may be preferred; also in the use of the regulating screws which hold said knives in their places, and graduate them as required; also in all the other particulars above specified, so far as they differ from all other machines heretofore known or used."

Improvement in Window Blinds; by John Parkerson, Boston, Massachusetts, October 11, 1828.

The plan proposed is to have two metal pins projecting from each end of the slats of which the blind is composed; these pins are to pass into holes made in moveable strips, confined within the edges of the frame of the blind. These strips are confined in their places, and made to traverse up and down, by means of flat disks or wheels, of metal, which turn on centre pins, between the sliding strips and frame, having each two pins in their peripheries, which pass into holes in the sliding strips, in the manner of the pins on the ends of the slats.

Improvement in the Revolving Rail, and Round Tenon Bedstead; by Garret Post, Auburn, Cayuga County, N. Y. Oct. 11, 1828.

Round side and end rails, with ratchet wheels and clicks, and palls, for tightening sacking bottoms, have been patented both in this country and in England. The present patent varies the use of round rails and tenons, by letting plates of metal into the posts, so as to be flush; these plates to have holes in their centres, to receive the tenons, and a circle of smaller holes at a sufficient distance from them to receive the points of bolts, fixed longitudinally in the rails, to retain them in their places, when the sacking is strained. It is also proposed, sometimes, to use the ratchet-wheel, cast so as to form a cap to the rail, having the tenon cast on to it, and affixed to the rail by screws. The rails to be tightened by a lever fitting into a hole in the rail, or by taking a hitch with a cord upon one of the pins to which the sacking bottom is fastened. The sacking is either to have holes worked in it, as usual, to hitch upon pins on the rails, or a cord is sewed within the edge of the canvass, and loops left to pass over the pins. To prevent the rails from springing, braces are formed by pieces of plank, placed edgewise, and passing from side to side, their ends being hollowed so as to fit the rails, which consequently retain these stretchers in their places.

A Machine for Cutting Files, called "Hatch's Improved File Cutter;" by John Hatch, Roxbury, Norfolk County, Mass. October 11, 1828.

This machine is intended for cutting files entirely by pressure, without a blow from a hammer. The whole instrument with its adjustments are necessarily complex; and as the object of cutting files by pressure is novel, the

patentee has not thought it necessary to claim any particular part, but has given a description of the whole.

The file to be cut is sustained upon a firm bed or anvil, the chisel, placed at the proper slope, is worked by a toggle joint, and the motion is regulated by a heavy fly-wheel. The file to be cut is carried forward by a screw, moved by a ratchet-wheel, the feed of which may be regulated. As files are taper, the bed upon which the file is cut, is raised or lowered by a sliding piece, which passes under it, and which advances with the file. The form of this piece must correspond with that of the file, being in shape exactly its reverse; that is, as files are thickest in the middle, this must be thinnest there, and diminish or increase exactly in this reversed proportion.

These are the essential features of the machine, but with respect to its operation, we have our doubts. File cutting machines have been repeatedly made, but we do not know that any of them have been found to answer so well as the hand of a clever workman; and we know that most, if not all of them have been abandoned. Two difficulties appear to us to present themselves in the action of a machine to operate by pressure; the first is, the necessity and extreme difficulty of making the blanks to be cut perfectly true, and all alike in their relative thicknesses; and without this, the guide cannot raise the bed so as to cause the cutter to bear every where with equal force. The plan proposed will not obviate this, nor do we know of any by which it can be overcome. The second difficulty which we apprehend is in the effect produced by pressure, when compared with percussion. We much doubt whether the same kind of edge will result from successive cuts by pressure, as by blows; this is a point which experience alone can decide, and we should like to know the result.

We could urge other objections, but forbear, and hope that the experience of the inventor may convict us of error in those already made.

A machine for Mortising and Tenoning Timber; by William Jackson and J. J. Speed, jun. Speedsville, Tompkins county, New York, Oct. 10, 1828.

The general construction of this machine is that of a common saw mill in minature, there being a frame with a carriage on it, upon which the piece to be mortised or tenoned is to be secured. There is an ingenious but simple contrivance for shifting the pieces laterally, so as to adjust them, by bringing the gauge marks to the saw or chisel. A saw is strained in the frame, when tenons are to be cut; and this for mortising is to be replaced by a chisel. There is a slip rail attached to the saw frame for straining the saw, or for adjusting the chisel, so as to enter the proper depth. A feeding arm causes the carriage to advance, by working on a straight rack. The ordinary mode of working the frame is by a lever, in the manner of the common pump handle. "The chisels to be used may be the common mortising chisel, the grooved chisel, or the common mortising chisel with a steel spring on the back, having a beard on the lower end of the spring next to the chisel, to lift out the core or chips." What we claim as our invention is the particular construction, as described by us, of the set or gauge for confining and regulating the timber. Also the slip rail in the gate, regulating the depth of the chisel, and straining the saw, together with the spring chisel before mentioned." "We also claim as a new application of parts heretofore known and used, the saw gate, balance, and lever, as before described."

An improvement in the Pump for drawing Beer and Cider, Soda Water, &c. by Levi Pitkin, Rochester, Monroe county, New York, Oct. 11, 1828.

THE object proposed is to get rid of the poisonous matter contained in the metallic tubes and chambers of the pumps generally used. The following is the whole of the specification:—

"The object of this improvement is to do away the corroding, or poisonous effects of using metallic substances, or materials, in the construction of such pumps. The construction of the improved pump is the same as those now in use, the only thing claimed as new being the materials of which this improved beer pump will be constructed; which are either lignum vitæ, ebony, or other suitable wood; marble, free, or other stone; stone or earthenware."

An improved mode of constructing Stereotype Blocks; Samuel G. Goodrich, Boston, Massachusetts, October 11, 1828.

This is a very simple and neat contrivance, for fixing stereotype plates upon a wooden block. A strip of brass, is firmly screwed on one edge of the block, which projects in two places, above its side, so as to form a lip, to receive one edge of the stereotype plate. A notch is cut on the opposite side of the block to receive, and allow play to a moveable lip of brass, which is to confine the other edge of the plate. This moveable lip is perforated with three holes in a row. The two outer holes have wires soldered into them, which project out about two inches, and slip neatly into corresponding holes in the edge of the block. From this same edge projects a screw, which passes through the middle hole; upon this screw a nut is fitted,

and is turned, first by the fingers, and then by a small wrench, so as to cause the projecting lip to embrace the plate firmly. A brass plate, the whole length of the block, is screwed upon its edge, so as to cover the notch of the moveable lip. This plate is hollowed at its upper edge, opposite the nut, to allow it to be turned with facility.

An improvement in the art of preparing the Backlint, or Fibres of Hemp, for manufacturing purposes; by Abraham K. Smedes, of Lexington, Kentucky, Obtober 11, 1828.

After separating the backlint, or fibres, from the wood, or bullen of the stalk, in an unrotted state, which may be done by hand, but more advantageously by machinery now used for that purpose, the hemp lint, or fibres, or back, to preserve it from tangling, should be loosely twisted, or tied into bundles, of a size convenient for handling. It should then be immersed in water, where it should remain until the epidermis, or thin outer membrane shall be destroyed, and until the vesicular or cellular substance which unites the longitudinal fibres, or a part of it, is also destroyed. The backlint, or fibres, may be immersed in water retained in vats, ponds, cisterns, or other convenient receptacles, or in running streams.

The time required for the preparation or completion of the process, depends somewhat on the temperature of the water; a considerable advantage results from heating the water, thereby facilitating the operation. When the water is confined in cisterns, or otherwise, from two to six days will be sufficient for the purpose of destroying the epidermis and part of the cellular substance, which may be ascertained by its becoming loose and slippery to the touch.

The hemp should then be withdrawn, and dried in the common air, or by fire. Let it then be run through the break again, which softens it, and disengages whatever particles of wood or bullen may remain attached to it, and also the cellular substance and epidermis, that may have dried upon it. It may then be applied to the scutcher, or hackled, which frees it from all the tow and dust, and leaves it in a proper state for market or use.

The great advantage resulting from the foregoing process, arises out of the ease and facility with which large portions of hemp can be prepared in a small space, and in a manner equal, if not superior, to that which is water rotted on the wood or bullen, and in a great measure removing the difficulties arising from the unhealthy and offensive effluvia growing out of the decomposition of vegetable matter.

An improvement in the mode of operating the rotary Steam Engine for Propelling Vessels, or Machinery, or for any purpose to which steam power is applied, by the application of steam to mercury; by Stillman Blake, Providence, Rhode Island, October 11, 1828.

A BUCKET wheel is constructed, similar to the common bucket water wheel, and either solid or close, so as to exclude any surrounding fluid from the inside. This wheel is made of iron, or any other strong material.

The wheel is enclosed within a cylindrical box or shell, which is air-tight, and sufficiently large to leave a small space between it and the surface of the wheel, for purposes hereinafter mentioned. This box is also to be made of iron, or some other strong material, in two or more parts, and secured together by bolts.

Into this box a steam pipe is introduced, and passes down between the wheel and shell, terminating nearly under the centre of the wheel.

From the upper part of the box, an eduction pipe leads to a condenser, where the steam, after having performed its office as below described, is condensed, and leaves nearly a vacuum in the upper part of the cavity between the wheel and the box, allowing the wheel to act more advantageously than it otherwise would.

The machine thus constructed, the space or cavity between the wheel and box, is filled with mercury nearly as high as the centre of the wheel. The steam is injected into the mercury, through the steam pipe, and immediately rises into the buckets, nearly under the centre of the wheel, and displaces a portion of the mercury.

The buckets, on one side of the centre of gravity of the wheel, being successively filled, or partly filled with steam, its buoyancy gives motion to the wheel, and the power afforded is in proportion as the weight of the mercury displaced exceeds that of the steam employed.

Motion is communicated to machinery, or to whatever steam power is applied, by passing the shaft of the wheel through an accurately fitted bearing, in the end of the box or shell.

It is intended that the buckets be filled about one-third part full of steam at first, and as they ascend, the pressure upon the steam is gradually diminished; it consequently expands, and at the surface occupies the whole space within the buckets, to the entire exclusion of the mercury, and affording a proportionable increase of power.

An Improvement in the Art of Melting and Fusing Glass, and the materials for making and forming Glass; by Thomas W. Dyott, M. D. Philadelphia, Oct. 10, 1828.

The discovery and improvement consists in using the *resin of pine*, commonly called rosin, as fuel, either alone,

or together with other fuel, for the melting and fusing-glass, and the materials for making and forming glass.

The advantages of the improvement consist—in the economy of time, in bringing on a melt, two or three hours sooner than can be obtained with wood; in the greater certainty of the quality of the glass; the *bache*, or composing materials, being frequently subjected to a strong heat by a wood fire, yet, in consequence of the quality of the wood, not strong enough to fuse, no heat applied afterwards will make the glass of good quality, although it may be melted, the salt and pearl ashes being decomposed before the fusing point of heat is brought on. By the use of rosin, this difficulty is obviated, the quality of the fuel being always the same, and unaffected by a damp atmosphere.—In the greater economy of the materials, the pots containing them being frequently broken, and the metal running into the furnace, mixes with the coals and ashes, and becomes black, of less strength, and fifty per centum less in value. In the use of rosin, the glass subjected to such accident, will run out nearly clear, and be as strong as at first.—In a great economy in the cost of fuel, saved principally in the difference of labour in sawing, splitting, oven drying, and preparing the wood; and in the difference of freight and hauling for the rosin, and in the greater security of the works, the quantities of wood necessarily collected being exposed to accidents by fire, to which the rosin will not be liable.

New Patents Sealed in 1829.

To Elijah Galloway, of King Street, in the borough of Southwark, for his invention of certain improvements in steam engines, and in machinery for propelling vessels, which improvements are applicable to other purposes. 2d July—6 months.

To Jacob Perkins, of Fleet Street, in the City of London, engineer, for his invention of certain improvements in machinery for propelling steam vessels. 2d July—6 months.

To Thomas Kilby, of Wakefield, in the county of York, clerk, and Hugh Ford Bacon, of Leeds, in the same county, gentleman, for their having found out and invented a new or improved gas lamp, or burner. 2d July—6 months.

To Robert Crabtree, of Halesworth, in the county of Suffolk, gentleman, for his having invented or found out a machine, or apparatus for propelling carriages, vessels, and locomotive bodies. 4th July—6 months.

To Margaret Knowles, of Lavender Hill, Battersea, in the county of Surrey, spinster, for her invention of an improvement in axletrees, for, and mode of applying the same to carriages. 4th July—6 months.

To William North, of Guildford Place, Kennington, in the county of Surrey, surveyor, for his having invented an improved method of constructing and forming ceilings and partitions for dwelling-houses, warehouses, workshops, or other buildings, in order to render the same more secure against fire. 4th July—2 months.

To George King Sculthorpe, of Robert Street, Chelsea, in the county of Middlesex, gentleman, for his having in-

vented certain improvements on axles or axletrees, and coach and other springs. 4th July—6 months.

To Joseph Cliseld Daniell, of Limpley Stoke, in the parish of Bradford, in the county of Wilts, clothier, for his having invented certain improvements in machinery, applicable to dressing woollen cloth. 8th July—6 months.

To William Ramsbottom, of Manchester, in the county of Lancaster, journeyman shape-maker, for his invention of certain improvements in power looms for weaving cloth. 8th July—6 months.

To William Leeson, of Birmingham, in the county of Warwick, in consequence of a communication made to him by his late partner, William Taft, of the same place, deceased, for an invention of certain improvements in, or additions to, harness and saddlery, part or parts of which improvements or additions are applicable to other purposes. 8th July—6 months.

To Moses Poole, of Lincoln's Inn, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in the apparatus for raising or generating steam, and currents of air, and for the application thereof to locomotive engines and other purposes. 8th July—6 months.

To Thomas Salmon, of Stokeferry, in the county of Norfolk, malster, for his having invented an improved malt kiln. 9th July—6 months.

To James Chesterman, of Sheffield, in the county of York, mechanic, for his having invented certain improvements on machines, or apparatus, for measuring land and other purposes. 14th July—6 months.

CELESTIAL PHENOMENA, for August, 1829.

D.	H.	M.	S.	
1	0	0	0	Clock before the ☉ 5' 58"
2	18	0	0	☽ in conj. with τ in Leo.
3	16	0	0	☽ in conj. with θ in Virgo.
3	22	0	0	☽ in conj. with η in Virgo.
5	0	0	0	Clock before the ☉ 5' 40"
5	0	0	0	☽ in conj. with θ in Virgo.
5	1	0	0	♀ in conj. with ρ in Leo.
6	9	0	0	☽ in conj. with μ in Leo.
7	10	13	0	☽ in □ first quarter.
8	1	0	0	☽ in conj. with γ in Libra.
8	10	0	0	☽ in conj. with δ in Libra.
9	3	0	0	☽ in conj. with φ in Oph.
9	18	0	0	☿ in conj. with δ in Cancer.
10	0	0	0	Clock before the ☉ 5' 4'
11	8	0	0	☿ in conj. with ♃ long. 6° in Cancer. ☿ lat. 1° 18' N. ♃ lat. 38' N. diff. lat. 40'
13	2	0	0	☽ in conj. with β in Capri.
14	10	26	0	Ecliptic opposition, or ● full moon.
15	0	0	0	Clock before the ☉ 4' 12"
15	1	0	0	☾ in conj. with θ in Aqua.
15	13	0	0	♀ in conj. with σ in Leo.
18	17	0	0	☾ in conj. with ο in Pisces.
19	23	0	0	♂ in conj with ☿ long. 26° in Cancer. ♂ lat. 1° 8' N. ☿ lat. 1° 46 N. diff. lat. 38'.
20	0	0	0	Clock before the ☉ 3' 8"
20	17	0	0	♂ in conj. with α in Leo.
21	1	35	0	☾ in □ or last quarter.
21	11	0	0	☾ in conj. with λ in Taurus
21	13	0	0	☾ in conj. with 1 δ in Taurus
21	13	0	0	☾ in conj. with 2 δ in Taurus
21	18	0	0	☾ in conj. with α Taurus.
22	5	0	0	♀ in conj. with β Virgo.
22	23	33	0	☉ enters Virgo.
25	0	0	0	Clock before the ☉ 1" 53'
27	12	0	0	☾ in conj. wiih ξ in Leo.
27	17	0	0	☾ in conj. with ο in Leo.
28	20	55	0	Eliptic conj. or ● new moon
28	21	0	0	♀ in conj. with μ in Virgo.
30	0	0	0	Clock before the ☉ 27"
30	0	0	0	☽ in conj. with τ in Leo.
33	13	0	0	☽ in conj. with β in Virgo.
30	14	0	0	☿ in conj. with σ in Leo.
31	11	0	0	☽ in conj. with μ in Virgo.
31	10	0	0	☽ in conj. with ♀ long. 5° in Virgo. ☽ lat. 19½' N. ♀ lat. 50½' N. diff. lat. 31'

☽ the waxing moon.—☾ the waning moon.

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, for June and July, 1829.

1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig't.	Low.	
June					
26	73	55	29,86	29,76	
27	72	46	29,62	29,50	,125
28	78	59	29,39	Stat.	,125
29	61	54	29,64	29,60	,05
30	67	50	29,67	29,65	,2
July					
1	61	53	29,62	29,39	,25
2	68	52	29,58	29,50	,35
3	66	51	29,58	29,26	
4	66	48	29,53	29,50	,275
5	63	44	29,58	29,53	
6	65	45	29,78	29,70	,2
7	63	54	29,70	29,50	,2
8	70	51	29,72	Stat.	,2
9	62	51	29,74	29,64	
10	76	42	29,84	29,71	

1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.	
June					
11	66	55	29,55	Stat.	,025
12	68	55	29,45	29,36	,475
13	72	51	29,70	29,56	,125
14	73	55	29,82	Stat.	
15	73	55	29,86	Stat.	,15
16	67	52	29,86	29,45	
17	61	47	29,85	29,52	,125
18	63	54	29,53	29,66	,325
19	69	57	29,76	29,94	,9
20	69	46	29,99	29,94	
21	76	46	29,98	29,83	
22	75	47	30,11	Stat.	
23	72	51	30,11	30,09	
24	77	49	29,96	29,87	
25	76	59	29,84	29,76	,475

Edmonton. C. H. ADAMS.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XVIII.

[SECOND SERIES.]

Original Communications.

ART. XVI.—ON THE PARALLEL MOTION OF A STEAM ENGINE.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—Having examined several treatises on the steam engine, and not been able to find any explanation of the principle upon which the parallel motion of one part of the engine is communicated to any other part, perhaps the following explanation may be acceptable to some of your readers. The insertion of the same in your useful Publication will much oblige

Your humble servant,

J. R. ARIS.

Sun Fire Office,
August 11th, 1829.

The usual method of making the top of the piston rod of a steam engine move up and down in a perpendicular direction, while the end of the beam moves in the arch of a circle, will be

seen by referring to plate XIII. fig 1, where *c*, represents the centre of the beam; *a*, the extremity of it; *a, d, b, e,* and *d, e,* a combination of levers attached to the beam, and connected together by the centres *a, d, b,* and *e*, forming the parallelogram, *a, b, e, d,*—*a, d,* being equal to *b, e,* and the lever *d, e,* to the parts of the beam *a, b,* and *b, c*. At *r, s,* is another lever, one end of which is joined to *e*, the corner of the parallelogram, and the other end to the fixed centre *r*, the length being equal to *a, b,* and *b, c*; so that when the beam is in a horizontal position, the centre *r*, will coincide with the point *d*. The levers *a, d,* and *b, e,* need not be any particular length; the longer they are, the truer the parallel motion will be.

Now the point *b*, fig. 2, of the beam rising on the fixed centre *c*, and the lever *r, s,* on the fixed centre *r*,—*r, s,* being equal to *b, c*, the point *b*, (which moves in the arch of the circle *b, u*), deviates to the right nearly the same distance, as the point *s*, (which moves in the arch of the circle *s, t*), deviates to the left, consequently the point *f*, (from which the top of the piston rod of the air pump is usually suspended), which is midway between *b*, and *s*, deviates neither way, moving up and down in a perpendicular direction. From the centre of the beam *c*, fig. 1, draw a line through the point *f*, and it will pass through the point *d*, and every point in that line that is connected with the parallelogram *a, b, e, d,* will move in a similar manner to *f*, consequently the point *d*, (where the top of the great piston rod is usually joined), will also move up and down in a perpendicular direction, the motion being double that of *f*, being twice the distance from the centre of the beam.

The communication of a motion to *d*, similar to *f*, is on the principle of the pentagraph, an instrument made use of for copying maps, &c. on the same or reduced or enlarged scales, which may be seen by detaching the lever *r, s,* from its fixed centre *r*, which compels every point in the line *c, d,* which is connected with the parallelogram (*a, b, e, d,*) to move in a perpendicular direction, and with a trace, making the point *f*, form a figure as

an ellipsis, for instance; then the point *d*, and every other point in the line *c*, *d*, will also form an ellipsis, the size varying in proportion to the distance from the centre of the beam *c*. Therefore if a parallel motion be required between the points *f*, and *d*, it must be somewhere on the line *c*, *d*, as *a*, *h*, fig. 4, or between the points *c*, and *f*, without the parallelogram, as at *i*.

Now it being more convenient that the point *r*, of the lever *r*, *s*, should be far enough beyond the point *d*, to be out of the way of the end of the beam, that place being given, it will be easy to determine the length of *r*, *s*, (see fig 3), as follows:—

Find the horizontal distance between *r*, and *c*, bisect that distance, and set it off from *c*, and it will fall on the point *b*; then *b*, *c*, will be equal to *r*, *s*, but not to *a*, *b*, as in the former figure; then if the parallel motion be wanted at the corner *d*, of the parallelogram, draw the line *d*, *c*, and it will intersect the line *b*, *e*, in *f*, nearer to *e*, than *b*; extend the line *b*, to *s*, making *f*, *s*, *e*, equal to *f*, *b*; then join the end *s*, of the lever *r*, *s*, to the point *s*, and place the other end *r*, so that the lever *r*, *s*, shall be horizontal; when the beam is in that position, then the points *f*, and *d*, will move in a perpendicular direction; but if the end *s*, of the lever *r*, *s*, is to be joined to the corner *e*, of the parallelogram, then draw a line from the centre *c*, fig. 4, through *f*, and it will intersect the lever *a*, *d*, in *g*, a little above *d*, where the piston rod must be joined, to make it move in a perpendicular line.

The application of the parallel motion above described is shewn in fig. 5, the end of the beam of the engine *a*, *b*, *c*, being elevated, and also by dots in its depressed position.

ART. XVII.—M. A. BERNHARD, ON HIS METHOD OF RAISING WATER OR OTHER FLUIDS.

To the Editors of the London Journal of Arts & Sciences.

GENTLEMEN,—In the July Number of your valuable Journal, in noticing my invention of " A Method, Principle, or Apparatus

for raising Water or other Fluids," after observing upon the experimental exhibition of my apparatus in the Kent Road, at which you witnessed the fact of the raising of considerable volumes of water to the top of the shaft, seventy feet high, you appear to express a doubt whether it was so raised by the expansion of the heated column of water, although you candidly admit you did not consider it possible that such quantities of water, as were discharged, would have been produced by the condensation of steam at the top of the shaft.

In your Journal for August, your Correspondent "Observator" cannot comprehend how, by the agency of any increase of temperature, the water in the boiler should effect an elevation of forty feet above the torricellian result; and in your editorial note on this communication, you state that "Observator" is not the only one of your correspondents who has expressed the same opinion, and in which, you add, you fully concur.

In attempting an answer to these and similar observations, I feel myself oppressed by my peculiar situation as a foreigner, without sufficient knowledge of English to appear before the public, except through the medium of a translation; and my embarrassment is further increased by the absence from London of the professional gentleman whom I should have wished to consult in the preparation of this letter; but I am willing to hope that any inaccuracies will meet with that indulgence for which this nation is so justly eminent.

I will first apply myself to the doubt suggested by you as to whether the quantity of water discharged at the height of seventy feet, arose from condensation, or actual expansion. To convince even the most sceptical on this point, I have contrived and fitted to my apparatus in the Kent Road a glass tube, placed nearly at the top of the ascending pipe, through which tube the passage of the *water* may be distinctly seen; and in this tube I have also fixed a thermometer, by which it will be perceived that the temperature of the water when at that height, is one hundred and forty only, which temperature would be much less if the vacuum were perfect.

Your Correspondent "Observator," and many practical engineers, I humbly conceive, lay too much stress upon the principles laid down in books written on the subject of the expansion of fluids at different degrees of temperature, which fixed principles, I humbly presume to hope, my apparatus and experiments in the Kent Road have proved to be capable of correction. The fault appears to be in fixing general principles for ascertaining the nature of fluids upon partial experiments.

It is, I contend, proper to make this distinction, viz. that all existing theories on the expansion of fluids have been adopted from experiments with the then known apparatus only; and in this point of view, my discoveries and experience will be found not to be in opposition to the established theory of philosophers, but only giving an opportunity for the further developement of that theory. Thus, in my special application of my apparatus, it is clear that I have raised WATER (and not, as supposed, STEAM from a distilling vessel), forty feet above the torricellian result, and it is clear therefore by the theory, as stated by "Observator," that "the increase of water as to bulk, between the freezing and boiling points, could not exceed one-twentieth of the column. From which, if true, it would, I admit, have followed that the column of water in my ascending tube would not have exceeded one foot and a-half, which cannot be relied upon. For it is evident that such column of water in the experiment you witnessed must have increased more than double, or what I venture to submit as one and the same thing, must have been reduced in its specific gravity one-half; notwithstanding the vacuum, which I have hitherto been able to establish in my apparatus in the Kent Road, has never (from causes inseparable from first experiments, and too obvious to need particularizing), exceeded twenty-six inches.

I do not consider myself called upon to raise new theories, by attempting to explain whether the heat operates mechanically or chemically upon the fluid; thereby occasioning an expansion or separation of its parts, and a consequent reduction of its specific gravity. I have only intended generally to apprize the learned

world of the fact, that fluids do actually rise, by means of my apparatus far beyond the point formerly supposed practicable viz. about 33 English feet in a perfect vacuum, without the aid of a lifting or forcing mechanical power.

You will now I trust permit me to say a few words upon the most important point in this matter; viz. the practical utility and application of my invention.

I conceive then that the invention is applicable to all the purposes for which the steam engine is at present employed. It is in itself beyond comparison less complicated, entirely free from danger in its use, less expensive in its first erection, and in its necessary repair, and occupies but little space when used as a prime mover with quicksilver.

I will beg leave to enumerate more particularly the advantages of my apparatus over the steam engine, when applied to supplying towns with water, draining mines, lakes, bogs, &c. 1st,—The capital for its first erection is not half what would be required for a steam engine, capable of raising the same quantity of water. 2nd,—The daily expense in repairs, fuel, attendance, oils, leather, &c. will not be half that of the steam engine. 3rd,—The time lost in adjustment, and the necessary repairs of the steam engine (during which its operation is generally suspended), is almost wholly saved, because my apparatus is not injured by friction. 4th,—All danger of loss of human life from explosion (which loss from steam engines since their first discovery may be estimated at thousands), is avoided; and 5th,—In the supplying towns with water, the purification (a point of the first importance) of that most necessary article, is effected to so great a degree, that I may venture to assert no longer contains any injurious matters or particles.

If any individual doubts the reality of the advantages I have pointed out, I am ready to undertake the erection of my apparatus, on a scale sufficient either for the supply of any required quantity of water, or for draining any mine, or producing power &c. in any part of England, upon terms to be agreed

upon; one of which may be that all shall be done at my own risk and cost, if I am unsuccessful.

I am unwilling further to trespass on the limits of your Journal, by attempting a special explanation of the application of my apparatus, as a prime mover for stationary or locomotive engines; but if you, or any of your readers, should feel interested in being made acquainted with what I conceive to be its undoubted advantages over steam engines in all those branches, I shall feel pleasure to continue my communications in a future Number of your valuable Journal.

I am, Gentlemen,
Your very obedient servant,
ANTON BERNHARD.

8, Finsbury Circus,
August 29th, 1829.

Recent Patents.

To GEORGE HADEN, *of Trowbridge, in the county of Wilts, Engineer, for his having invented certain Improvements in Machinery for dressing Cloth.*—[Sealed 2d March, 1829.]

IN dressing and finishing woollen cloths of superior qualities, it is desirable, in conformity with the present fashion, to produce upon the face of the cloth a high degree of lustre. This has usually been effected by submitting the cloths to a process called *roll boiling*, that is, immersing the tightly rolled cloths in vessels filled with hot water or steam; and after thus experiencing the action of the heat for several hours, the cloths being allowed to become cold, will have acquired a brilliant shining appearance,

and retain that lustre until the face or nap of the cloth is nearly worn off.

Another object in dressing cloths is to lay evenly the nap or ends of the wool, for the purpose of producing a soft smooth surface, and this has been done by continued brushing, either by teasles, wire cards, or bristles, put in motion over the face of the cloth.

The intention of the Patentee, in the present instance, is to produce both these objects, by the evolution of one machine, that is the brushing or laying of the nap by slowly revolving brushes, and polishing the face by rapidly revolving calendering surfaces.

SPECIFICATION.

" My improvements in machinery for dressing cloths have for their object the performance of two distinct operations in the finishing of woollen cloths, both of which are carried on in one machine simultaneously. These operations are laying the pile or nap on the face of the cloth, by means of a series of brushes, or cards and brushes, or any other suitable material, moved by *a comparatively slow motion*, and at the same time polishing and fixing the nap so laid by the *rapid rotation* of heated calendering cylinders; the effects of which conjoined operations is to give the cloth a smooth, free, and a permanent lustre.

" The improved machine exhibited in the accompanying drawings (see Plate XIII.), bears some resemblance to a gig mill. It is therefore to be understood, that I do not intend to claim all the parts of the said machine as of my invention, but shall particularize those features of novelty which I do claim, after I have described the construction and arrangement of the whole.

" Fig. 6, is a front view of the machine complete; fig. 7, is the right hand end of the same; fig. 8, is the left hand

end, and fig. 9, is the appearance of the back of the machine. Fig. 10, is a vertical section taken transversely through the machine at the dotted line *A*, *B*, in figs. 6 and 9 : similar letters referring to corresponding parts in all the figures.

"Rotatory motion is communicated to the machine from a steam engine, or any other first mover, by means of a band and rigger, or toothed gear attached to the main axle *a*, which axle carries the operating parts of the machine ; *b*, *b*, are two drums or open cylinders, formed of rails of wood, and mounted on axles supported in plummer boxes attached to the frame of the machine. On one of these drums *b*, the piece of cloth intended to be dressed is first wound ; its end is then carried over the tension rollers *c*, *c*, and made fast by canvas sewn on to the forel to the other drum.

"Near the end of the shaft of each of these drums a toothed wheel *d*, *d*, is mounted, and which slide round loosely upon the shafts as their axles. Both of these wheels *d*, take into the intermediate wheel *e*, which is mounted loosely upon a stud fixed to the side of the frame, and is driven by a smaller toothed wheel *f*, on the main axle *a*.

"Coupling boxes *g*, *g*, having ratchet teeth, slide on the square part of the shafts of the drums, and by a movement of the perpendicular standard rod *h*, with its tappets *i*, *i*, taking into grooves in the coupling boxes, these boxes are slidden to and fro, which causes the shafts with the drums to be alternately thrown in and out of gear with their respective wheels *d*.

"This is effected by shifting the lever or handle *k*, to the right or left, which produces a lateral movement of the horizontal rod *l*, connected to the standard *h*, and

causes the tappets to slide the respective coupling boxes in or out of gear.

"Let it now be supposed that the piece of cloth has been wound upon the lower drum, and its end conducted over the tension rollers *c*, *c*, and made fast to the upper drum as before described; the upper shaft must now be thrown into gear for the purpose of drawing the cloth progressively from the lower drum, the axle of which being out of gear, will run round freely as the cloth is drawn off, the tension of the cloth being maintained by the friction of a weighted lever *m*, bearing upon the periphery of the friction wheel *n*, as shewn particularly in fig. 3.

"The manner of conducting the cloth through the machine being shewn, I now proceed to describe the operative parts by which the dressing of the cloth is to be effected.

"On the main axle *a*, I mount the carrier wheels *o*, *o*, the arms of which support the brushes or cards, or teasle boards *p*, *p*, and which are attached thereto by screw bolts, or by any other convenient means, and extend across the machine. Between the brushes or card boards, the calenderers *q*, *q*, *q*, are placed, which are hollow cylinders of copper, or other metal, revolving on axles or pivots, supported in plummer boxes on the peripheries of the carrier wheels *o*, *o*. These cylinders are intended to be heated by steam, introduced from a boiler through the pipe *r*, and axle *a*, into the steam box *s*, a part of the axle *a*, being made hollow for that purpose. From the box *s*, the steam passes through small pipes *t*, *t*, *t*, with stop cocks, the ends of which pipes are inserted into the hollow axles of the respective calendering cylinders *q*, and the steam thus conducted is allowed to flow through small apertures in the hollow axles, so as to fill the cylinders and heat their surfaces, the condensed steam being

allowed to discharge itself through any convenient opening at the ends or elsewhere.

"At one end of the axle of each cylinder a pinion *u, u, u,* is attached, which pinions take into a stationary toothed wheel *v*, firmly fixed to the frame of the machine by screw bolts, as shewn in fig. 8.

"It will now be perceived that rotatory motion being given to the main axle *a*, by a rigger, or otherwise, as before described, the carrier wheels *o, o,* which may be considered as a gig barrel, will revolve, and the brushes, or cards, or teasles *p, p,* will by that means be made to act against the face of the cloth distended between the tension rollers *c, c,* and consequently to brush and smooth the pile; at the same time the calendering cylinders *q*, also carried round by the gig barrel, will in consequence of their pinions *u*, taking into the teeth of the fixed wheel *v*, be made to revolve rapidly on their axles; and by the friction of their heated surfaces upon the face of the cloth, the pile which has been smoothly laid, will become polished and acquire a permanent lustre.

"I recommend that the brushes, cards or other materials upon the arms of the carrier wheel *o*, should be placed in a curve, the radius of which is about equal to the whole diameter of the gig barrel, as by that means the points of the brushes or wires will come progressively into contact with the face of the cloth at an acute angle, and thereby act more delicately upon the pile or nap than if they formed radii equal to the semi-diameter of the gig barrel.

"The breasting of the cloth, and consequently its pressure against the polishing surfaces may be increased or diminished by shifting the situation of the lower tension roller *c*. This may be done by turning the pinions *w, w,* by

means of the winch and endless screws x, the pinions taking into racks y, y, which slide in segment grooves, and carry the pivots of the lower tension roller, as shewn in fig. 8.

"When the whole length of the cloth has been drawn off the lower drum on to the upper one, by the means above described, the handle z, of the friction lever is to be raised so as to release the lower drum, and bring the friction break against the wheel of the upper one; the handle is then to be shifted so as to throw off the upper coupling box and lock the lower one to the wheel; by which means the rotation of the wheels will cause the cloth to be drawn back and wound upon the lower drum, the friction of the upper break retarding the rotation of the upper drum, and causing the cloth to be drawn tightly, while winding for a repetition of the dressing proces.

"I perform the above described operation while the cloth is in a wet state, and I find the effect improved by occasionally introducing a jet of cold water, which may be conveniently done by the employment of a pipe j, j, extending across the machine, having many small perforations, and a stop cock to be opened or closed, as occasion may require.

"Having described the particular construction of my improved machine for dressing cloth, I now wish it to be understood, that I do not confine myself to the precise arrangement of the parts as exhibited in the drawings, knowing that many variations might be made without materially altering the general plan of the machine or its effects when put into operation; neither do I intend to limit the number of brushes or of calendering cylinders to be contained in a machine for dressing cloth, but I claim as my invention the adaptation of heated calender-

ing cylinders which revolve upon their axles and work upon the main cylinder, to a gig mill or brushing machine, or to any similar apparatus for dressing of wollen cloth.—[*Inrolled in the Rolls Chapel Office, Aug.* 1829.]

Specification drawn by Mr. Newton.

To WILLIAM BRUNTON, *of Leadenhall-street, in the city of London, Civil Engineer, for his Invention of a machine apparatus or instrument to ascertain and register the quantity of specific gravity and temperature of certain Fluids in Transit, part or parts of which invention is or are applicable to other purposes.*—[Sealed 4th December, 1828.]

THE subject of this Patent is a small piece of mechanism, to be attached to various apparatus, as a meter to measure and indicate the quantity of any particular fluid passed through it; with a mode of ascertaining the specific gravity of the fluid, and of making or registering the same. The contrivance is not altogether new, but its present form and mode of adaptation present features of novelty and ingenuity. We give the explanation in the words of the Patentee.

SPECIFICATION.

"I measure and register certain fluids in transit by passing them through a cylinder with a piston and rod, having a nozzle and valve, or cock, in all respects like those of a steam engine, except that I prefer to pack the piston with leather, when the fluid to be measured does not exceed 80 degrees of heat, Faht.

"The fluid by its static pressure against the piston,

moves it with sufficient force to raise a weight upon an inclined plane, during the whole range of the impulse, and thus generating a power, which at the termination of the impulse is capable of moving the valves or cock, and reversing the static pressure on the piston, which cause a new impulse in the opposite direction, and during this the weight is again raised. Thus each impulse generates a power capable of changing the position of the cock or valve, and produces a continuity of motion, expressive of the quantity of fluid discharged.

"Plate XIV, fig. 1, represents the cylinder *a*, which I prefer to be laid horizontally, with the nozzles upward, in order that the air may readily escape on the introduction of the fluid to be measured; *b*, are guides for the piston rod, the cross bar of which works in the slits; and at the end are adjusting screws, which prevent the piston from moving beyond its proper limits; *c*, *c*, are two guards, which being placed immediately under the range of the pin of the roller *d*, prevent it from falling until it has attained the ends of the guards, which are adjusted to suit the same limits of stroke as the pins in the guides; the roller *d*, and connecting rod *e*, shewn by dots, are made sufficiently heavy either in their own substance or by weights added thereto, to move the cock or valve freely, when acting upon the ends of the reciprocating lever *f*.

"To ascertain and register the specific gravity of fluids in transit, I suspend or fix a cistern or vessel upon the end of a beam or balance, having the pipes which convey the fluid to and from the said vessel, extended to the centre line of the balance, and there united to the conveyance pipes by two flexible joints. To the opposite end of the said beam a weight is suspended, capable of balancing the cistern when filled with a fluid of the mean specific

gravity of that particular fluid which is intended to be assayed.

"To any convenient part between the centre of the beam and the end, I suspend or attach a plunger of glass, ivory, or other suitable material, a part of which is immersed in mercury, so that if the fluid in the cistern be heavier or lighter than the balance weight at the opposite end, the equilibrium will be restored by the immersion or emersion of a portion of the plunger; the point at which the beam will be in equipoise will therefore be expressive of the specific gravity of the fluid contained in the cistern or vessel.

"For the purpose of ascertaining and registering the temperature of fluids in transit, I construct what I call an operative thermometer, by uniting several discs or circular plates of thin copper or brass, alternately by their edges and middles. Through the centre of these united plates, I make a small hole, which forms a communication through the whole series of discs, and constitutes a metallic cellular vessel, capable of some degree of expansion and contraction, by the elasticity of the plates of metal; this vessel is united to a coil of pipes capable of containing from 50 to 300 times more than the contents of the cellular vessel or discs.

"I fill the coil of pipes and the cellular vessel with spirits of wine, linseed oil, or any other suitable fluid possessing sufficient expansibility by heat, and close the same perfectly tight. The coil is then enclosed in a cistern or chamber, through which that fluid passes, the temperature of which is to be ascertained, and in its transit communicates its temperature to the fluid contained in the coil, and causes an expansion or contraction of its volume (similar to that in the mercury of an ordinary thermometer), which increase or diminution is forced into the

cellular vessel, or drawn from it, and will cause it to expand or contract accordingly, and thereby express the temperature of the fluid surrounding the coil contained in the cistern or chamber.

" Having explained the respective methods by which I ascertain the quantity, specific gravity, and temperature, I now proceed to describe the manner in which they are combined, and constitute one machine, apparatus, or instrument, as shewn at fig. 1, the particulars of which are more clearly exhibited in the following figures, in all of which the respective parts are represented by the same letters.

" I construct a frame or balance *a*, *a*, which is suspended on centres *b*. To the end of the frame or balance is fixed the cistern *c*, with the operative thermometer *e*, also the measurer *d*, as already described in the preceding figure.

" From the exit branch of the cock is extended a bended pipe *f*, *f*, terminating against or upon the centre line or axis, within the balance frame, in a glass mouth-piece, covering the end of a perpendicular pipe of glass *g*, standing up in the middle of a cup of mercury *h*, in which the mouth-piece is inserted so far as to resist the statical pressure of the fluid within.

" A pipe *i*, connects the cistern *c*, with the induction branch of the cock, through which the fluid enters the measuring cylinder *d*. Another pipe *k*, extends from the cistern to the centre line of the balance frame, and there terminates in a glass mouth-piece inserted in a cup of mercury in all respects like that already described, only connected with the induction pipe *j*.

" I attach to the standard *l*, of the balance frame a plunger *m*, suited in its shape and section to the nature of the fluid it is intended to weigh or assay, which plunger is introduced into the mercury contained in the cup *n*. To

the back end of the balance is attached a weight sufficient to counterpoise the frame, with its appendages, when filled with fluid of the mean specific gravity of that for which the machine is intended, see fig. 2.

It will now be manifest, that if the machine be thus constituted, and spirituous liquor be poured through the pipe *j*, (see the partial representation, fig. 3), it will fill the chamber *c*, and then through the pipe *i*, will fill the ends of the cylinder alternately, and will ultimately run out at the pipe *p*.

" That the air may be perfectly expelled from the machine when it is set to work, the cock of *p*, must be shut, and the small air valves *q*, *q*, in the pipes *f*, and *k*, opened, until a small quantity of the liquor rises through them, when they must be shut and the cock *p*, opened.

" The machine being supplied with spirituous liquor, will now, by the number of the strokes of the piston, indicate the quantity passed through it; and the preponderance of either end of the balance frame indicated by the pointer on the scale *r*, will express the specific gravity of the liquor; and the thermometer *e*, will, by its expansion or contraction, indicate the temperature of the liquor as it passed.

" I will now describe the manner in which these particulars, viz. the quantity, specific gravity, and temperature, are registered. I construct upon the sector of the cock, or the valve, a pair of pallets, which work into and turn round tooth by tooth, the wheel *r*, upon the end of the shaft *s*, which extends to the centre line of the balance frame, (as shewn in) fig. 4, and there by a screw communicates motion to the wheel *t*, and the cylinder *u*; on the outside of which is fixed a paper. This cylinder is supported upon two centre points, screwed into the top and bottom of the cylinder frame. Into the same frame, and in the centre

line of the balance frame are two fixed guides, w, and x, with internal grooves, to guide two pencils parallel with the surface of the paper, to indicate the temperature and specific gravity.

"At a short distance from the lower end of the cylinder is suspended the lever v, into which is fastened a pencil pressing against the surface of the paper on the cylinder. From the middle part of the lever extends upwards a rod and loop, which rest upon a small cam or eccentric on the shaft s, and by every revolution raises the pencil of the lever v, a short distance, and letting it fall again makes upon the paper an indented line, expressive of so many gallons or other specific measures, according to the capacity of the measuring cylinder, and the number of teeth in the wheel r.

"Near to the upper part of the cylinder u, another pencil is fixed into a socket easily moveable between guides w, and occupying the grooves nearest to the cylinder u; this socket is connected by a rod to the end of the lever y, which communicates motion to the pencil, by the expansion or contraction of the thermometer e, and consequently will describe upon the revolving paper a line expressive of the temperature of the liquor, of which the lever v, marks the quantity.

"Another pencil is fixed into a socket easily moveable between the guides w, and occupying the grooves farthest from the cylinder u; this pencil is connected by the looped rod z, to the lever x, supported upon the upper end of the standard l. The other end of the lever x, is attached to a fixed point by the connecting rod. Then, as either end of the balance frame preponderates, the lever x, will move the pencil between the guides w, and upon the revolving paper will describe a line more or less elevated, expressive of the specific gravity of the liquor, the quantity of which is marked immediately under.

"The paper, before it is put upon the cylinder, I rule with lines suited to the strength and temperature of the liquor to be assayed: thus, to express the specific gravity of spirits, I draw a strong line at the same height from the bottom of the paper as the pencil of the machine would mark, if the machine were filled with proof spirits; to shew the temperature by ruling a strong line at the height where the machine would mark 60 degrees Fahrenheit; then, on each side of these lines at proper distances, I draw parallel lines, expressive of the higher and lower degrees of the specific gravity and temperature, which may be found practically useful. The value of the lines drawn by the machine are rendered easily determinable by their falling between or intersecting these preparatory lines of known import.

"In the application of part or parts of this invention to other purposes, I construct an instrument by combining the motion of the balance frame and that of the operative thermometer to effect one index or pencil, and to indicate or register the strength of the spirits, as if the whole were sampled at one temperature; for which purpose I divide the portion of the plunger *m*, fig. 5, which I intend shall work in and out of the mercury into 100 equal parts with sub-divisions, by which all the varieties of specific gravity from distilled water to alcohol shall be indicated; I then construct another plunger, which I distinguish by the appellation of the compensation plunger of the same length, and divide it in the same manner, and I make its sections at these divisions proportionate to the expansibility (by heat) of spirits of the various specific gravities expressed by these divisions. The compensation plunger works in the same cup with the other plunger, and is attached to the lever *a*, *b*, the fulcrum of which is in the centre line of the axis of the balance frame, and its other end connected to the operative thermometer, so that its motion

between the point at which it stands at 30 degrees Fahrenheit, and that at which it stands at 80 degrees, shall be sufficient to emerse or immerse a portion of the plunger, and thereby move the balance frame so as to indicate or register an expression of the specific gravity, as a compensation for the expansion or contraction of the spirits in the machine by their temperature being above or below the degree of heat at which it is intended to register their strength. The two instruments specified are only applicable to what are known by the term spirituous liquors, at some intermediate temperature between 30° and 80°.

"I also ascertain and register the quantity and temperature of water for feeding steam engine or other boilers, by the application of the measuring part of the above specified apparatus with the revolving cylinder, and the operative thermometer without any part of the apparatus which respects the specific gravity; in this application I prefer the piston to be packed with flax or hemp.

"I also measure the quantity of spirituous liquors, wine or other fermented liquor, by the application of the measuring part of the apparatus only.

"I also regulate the heat or temperature of the inside of still-heads, worms, or other vessels, which it is desirable to maintain at an equal heat, and to which my operative thermometer may be applicable, by inserting the coil of the operative thermometer into the still-head, worm, or vessel, and connecting the expansive and contractive force of the instrument, to the shutting and opening of the steam cock or valve through which such vessel may be heated, or to the shutting and opening of the damper of the fire, by which such vessel may be heated, or to the opening and shutting or regulating the water cock or valve, by which the uniformity of temperature of each vessel may be maintained.—[*Inrolled in the Inrolment Office in Chancery, June,* 1829.]

Specification drawn by the Patentee

To EDMUND GIBSON ATTERSLEY, *of York-place, Portman-square, in the county of Middlesex, Esq. for his having invented or found out an Apparatus for a Method of generating Power, applicable to various purposes.*—[Sealed 12th June, 1828.]

THE title of this Patent promises but little in the way of science. *Generating power*, except through secondary means, belongs not to man; we have but the capability of applying power derived from elementary sources resident in the hands of nature. Speculators in perpetual motions have aimed at such an object, not knowing the principles of the science in which they were beginning to dabble, and of this description we expected to find the subject before us. But as far as we understand the Patentee, he appears to have formed a project without the smallest appearance of plausibility, even palpably impossible, to be put in action.

We should apologise for encumbering our pages with such absurdity, but that professing to give the principles and details of every Patented invention, we do not feel ourselves justified in withholding this.

Plate XIV, fig. 6, exhibits a frame with standards of iron or wood, *a*, *a*, on which the apparatus is mounted; *b*, *b*, is a long horizontal bar or lever, swinging upon pivots *c*, in the middle, as its fulcrum, which bear upon the upper rail of the standard or frame. At right angles to *b*, and attached to it, is a perpendicular bar *d*, carrying a heavy weight *f*, at bottom, like the plummet of a pendulum; and *e*, *e*, is a semicircular brace for fixing and keeping the levers at right angles.

Another lever *g*, is also mounted upon pivots, supported

on the standard; the lower arm of which lever is attached to one end of the lever *b*, by a joint; the shorter arm, or reverse end, is connected by means of a rod or chain *h*, to a crank, or any other part of the machine intended to be driven by the power communicated, or, as the Patentee says, *generated*, by this piece of mechanism. There is a weight *i*, attached to one end of the lever *b*, and another weight to the end of the longer arm of the lever *g*, both of which are capable of being shifted along the levers, and which the Patentee says he believes will increase the power.

The mode of putting this mechanism in action is by applying a force to the lower part of the lever *d*, by which it may be made to vibrate; the consequence of which is intended to be that the levers shall be thrown into the positions, shown by dots, and the crank attached to the rod or chain *h*, raised or driven round.

Now, according to the figure represented in the drawing, there would be no possibility of moving the levers without some sliding contrivance at the junction of the levers *b*, and *g*, which is not provided for in the Specification. But if such contrivance did exist, it is quite obvious that whatever force might be applied to move the lever *d*, there would be no more power obtained to drive the crank at *h*, than if that same force were applied as a pump handle to the end of the lever *g*; even less by the amount of friction. And instead of continuing to exert a power, the force necessary for moving the lever *d*, out of the perpendicular position, must be exactly the same as it would itself exert by its own gravity in falling back again. Such is the project for generating power proposed by the Patentee.—*Inrolled December*, 1829.]

To John Hague, *of Cable-street, Welclose-square, in the county of Middlesex, Engineer, for his having invented certain Improvements in the method of expelling the Molasses or Syrup from Sugar.*—[Sealed 6th of December, 1828.]

There are two modes proposed by the Patentee of extracting the molasses or syrup from sugar; the one is by producing a vacuum or exhaustion of the air under the sugar, by which the weight of the air above will be enabled to cause the liquid part to precipitate through, and leave the sugar dry; the other is by condensing the air above the sugar, and by its mechanical force producing the same effect.

Various forms and constructions of apparatus may be applied to this purpose, and the Patentee therefore does not confine himself to any one in particular, the improvement consisting in the employment of a false bottom to the pan or vessel in which the sugar is to be operated upon.

This false bottom is to be made of copper, with perforations all over it like a cullender and placed a few inches above the real bottom of the vessel; upon the false bottom a straining cloth is to be laid, and the sugar spread a few inches thick upon the cloth.

The lower part of the vessel below the false bottom being air tight, a pipe from an air pump is to be introduced into the vessel under the false bottom, and the pump being put in action by any convenient means, as by a hand lever, or by connection to a steam engine or water wheel, the air between the false and real bottoms will be drawn out, and a vacuum thereby produced. The pressure of the air above will then cause the molasses to pass through the sugar, and through the straining cloth, and having descended

through the perforations to the bottom of the vessel, may from thence be occasionally drawn off by a pipe, with a cock inserted into the bottom of the vessel, leaving the dry sugar above.

It is unnecessary to describe the construction of an air pump, as that is well known, and a vessel of any convenient form with a perforated false bottom will answer the purpose, provided the sugar is so spread as to cover the bottom completely; and the operation will be further promoted by occasionally sprinkling a little water, or water impregnated with lime, upon the upper surface of the sugar.

The upper part of the vessel being closed, an air pump may be employed to force in a quantity of air, which becoming condensed above the surface of the sugar, will force the molasses and other liquid parts through the sugar into the lower vessel, as above described.

Either of these operations may be performed, or both may be brought into action together, and the molasses will by these means be more effectually extracted from the sugar, than by any other process heretofore employed.—[*Inrolled December*, 1828.]

To LIONEL LUKIN, *of Lewisham, in the county of Kent, Esq. in consequence of communications made to him by a Foreigner residing abroad, and discoveries made by himself, for certain Improvements in the manufacture of Collars for Draught and Carriage Horses, and Saddles for Draught Carriage, and Saddle Horses.*—[Sealed Aug. 1st, 1827.]

THE object of this inventionis to obtain a lateral flexibility both in the collars and saddles of horses, in order that they may lay close to the neck or back of the horse, and

enable one collar or saddle to fit various horses, without the necessity of extra padding.

The mode of effecting this object, as proposed by the Patentee with regard to the collars, is by forming a metallic frame, in some measure resembling hames, and attaching to this frame suitable pads, which shall bear against the neck of the horse.

Plate XIV, fig. 7, represents a collar on the improved plan; *a, a,* is the iron frame, furnished with suitable eyes, lugs, and rings, to attach or pass the straps through; *b, b,* are the pads, each formed of wooden boards which embrace the side bars of the frame; they are covered with leather, and are stuffed on the inner surfaces, and turn partly round upon the frame as axles; *c, c,* are the lugs, to which the traces are to be attached; *d,* is a strap going over the neck of the horse, by which the collar is prevented from falling when the horse is going down hill; *e,* is a pad bearing against the breast of the horse, for the purpose of guarding the strap *f, f,* by which the lower part of the frame of the collar is kept together.

This plan of constructing a horse's collar may be slightly varied without deviating from the principle; that is, the metallic frame may be invented, and the pads otherwise disposed preserving the leading feature of the invention, which is to enable the pads *b, b,* on the sides to move so as to lay close to the neck of the horse.

Fig. 8, shews the method of constructing a saddle for a draught horse; *a, a,* is a bent metallic frame, in place of the saddle tree; *b, b,* are the pads which are to bear against the horse's back. These are formed by pieces of wood covered with leather, and stuffed on the under side; the pads are attached to the frame by screws which pass through the joints or knuckles at *c, c,* and being inserted

into the wood, hold the pads securely, yet allow of the vibrating action of the pads on the knuckle joints.

Fig. 9, shews a saddle tree for a riding or dragoon saddle; *a, a,* is the ordinary frame of wood; *b, b,* are flaps under the frame, which are connected to it by hinges; this saddle tree is of course to be covered with leather, in the ordinary way, and the under part of the flaps, are to be padded or stuffed in a proper manner, to lay close to the horse's back, the hinges allowing of the flaps rising and falling, according to the form of the back of the animal.—[*Inrolled February,* 1828.]

To Joseph Rayner, *of King-square, in the parish of St. Luke's, in the county of Middlesex, Civil Engineer, for his having invented or found out certain Improvements in Apparatus and Machinery for conducting Heat, and applying the same in the operations of washing, scouring, cleansing, fulling, dressing, dying, and finishing Woollen Cloths; and in calendering, straining, glossing, polishing, and finishing Silks, Cottons, Linens, Woollens, and all other goods to which the same may be applicable.*—[Sealed 5th February, 1829.]

The leading feature of this Patent is the contrivance of passing heat through a fluid such as water, for the purpose of heating tubes or vessels of any form, the surfaces of which vessels becoming heated, may be applied to various purposes in the manufacture of cloths. The apparatus consists of a vessel filled with water, and placed in contact with a fire, by which the water is made hot; and from this vessel pipes are conducted in such directions as shall enable the hottest part of the water to flow through the upper pipes to that part of the apparatus

where the heat is to be brought into operation; and these becoming cooled by the abstraction of the heat, the colder part of the water flows downwards, back into the boiler. Thus the vessels and pipes being all filled with water, a continued current of the heated fluid will pass along the upper part of the range of the apparatus; and the cooler part of the fluid will of consequence run back through the lower part into the boiler.

SPECIFICATION.

"My improvements consist in the invention of the application of an apparatus for generating and conducting heat by the circulation of heated fluids to the process of manufacturing of woollen and other cloths, and of polishing and finishing the same, by which certain improvements are effected in the said process; also in the invention of the application of apparatus and machinery to such other useful purposes as are hereinafter described, and exhibited in the accompanying drawings.

"Plate XV, fig. 1, represents a section of a generater or boiler, which may be constructed of cast or wrought iron, or any suitable material, secured by a safety valve, and placed on its end, suspended by parts projecting into the brick work, as shewn in the figure. The fire is placed under the end, and the flues are constructed to circulate spirally or otherwise around the gene rater, which by passing over a large portion of the surface of the generater, will effect considerable saving in the consumption of fuel. To the generater may also be adapted and connected a pneumatic apparatus, which will effect a more complete combustion of the fuel, and a consequent saving of expense. This pneumatic apparatus may be a pair of bellows of the usual construction, or a cylindric or tubular blowing apparatus, as circumstances may render convenient. The generater is charged quite full of fluid (water being preferable in ordinary cases, on account of its cheapness), and heated to the required temperature. Should any loss of the fluid arise from leakage at the joints, or otherwise, it is supplied by the cis-

tern *a*. To the projecting flanches or nozzles *b*, *c*, pipes are connected, for conveying the heated fluid; *d*, *d*, *d*, represent a safety valve, lever and weight; *e*, *e*, a tube or indicater, by which the degree of heat the fluid has obtained may be known; it will also serve as an air tube when the generater is charged with fluid, and will also indicate the quantity of water in the generater; *f*, *f*, represents the furnace or grate bars; *g*, *g*, the hoppers by which the fire is supplied with fuel.

"To the generater thus described, a pipe is attached at the nozzle *b*, which may be conveyed in any direction, and made to communicate with cylinders, the exterior casing of wood vats, or other contrivances, and is connected with a return pipe entering at the nozzle *c*, and which will cause the entire circulation of the heated fluid, which may thus be applied to furnace dying, heating stocks, or fulling mills, or any similar purpose, which admit of an exterior and interior case being so placed as to permit the hot fluid to act freely upon the object to be heated; and the degree of heat required will be obtained by regulating the degree of heat to which the fluid in the generater, fig. 1, is carried.

"I proceed to describe the method of applying the circulation of heat by fluids to such purposes.

"Fig. 2, represents an horizontal view of an appparatus for transmitting heat by fluids or liquids, for the purpose of heating a drying stove for cloths of any description, or for any other useful purpose where a soft and mild heat is desirable, and in particular where great security from fire is required, for as the heat may be conducted to almost any reasonable distance, and the generater being placed in a situation of security at a distance from the drying stove, the risk from fire is reduced to a minimum, or the least possible, under any construction of heating apparatus; *h*, represents the top of the generater (as seen at fig. 1), and the heated fluid passes along the pipes *i*, *i*, *i*, *i*, &c.; *j*, is the counter generater, by which the more rapid circulation of the heated particles is secured. The bent pipes present an

extended surface, from whence heat is passing by radiation in rapid succession. The generaters in this case are placed as much lower than the stove as circumstances will admit; and the pipes or tubes are laid on a wall or any other solid foundation, by which they may be firmly supported and kept in the situation in which they are placed. The same apparatus will apply with advantage to heating buildings or manufactories, under various modifications of construction, adapted to the circumstance of each particular case; but the application to buildings or manufactories, I do not claim as any part of my invention.

"Fig. 3, represents an application of the apparatus to the purpose of indigo or vat dying, by which any number of vats may be heated at one time. The heat is conveyed by the fluid along the pipes, and round a casing or interior tube, placed in the vat; and the heat may be increased or diminished by turning the stop cocks; *k*, *k*, represents the generater and counter-generater; *l*, *l*, *l*, *l*, &c. represent the vats in section; *n*, *n*, the circular tube or casing, within which the hot fluid circulates; *m*, *m*, the stop cocks, through which the fluid passes into the casing of the vats; *o*, *o*, *o*, *o*, are the pipes through which the fluid circulates.

Figs. 4, and 5, represent applications of the apparatus to drying calicos, prints, and other manufactured articles; *p*, *p*, *p*, *p*, are rollers, on which pieces of calico are alternately rolled,—it then passes over the hot cylinders *q*, *q*, *q*, *q*, to the roller *p*, *p*, at the other end, on which it is rolled by the motion of the shaft *r*, through the medium of a strap or band; and when the piece to be dryed is drawn out to the end, the motion of the shaft *r*, is reversed by any of the usual modes of changing the motion, and the cloth is rolled back on the rollers *p*, *p*, at the other end; and this operation is repeated until the piece is sufficiently dry.

"The cylinders are heated by a generater, and the heat passes through each cylinder in succession, and the fluid or liquid returns by circulation for fresh supplies of heat to the

generater; *s*, *s*, represents the pipes by which the hot fluid or liquid passes to each cylinder in succession, &c. These apparatus may be made under various arrangement of construction; and fig. 5, is given as another application of the principle to drying piece goods; *t*, *t*, represent a case charged with heated fluid or liquid, and of sufficient width to dry the extended breadth of the piece; *u*, *u*, are nozzles or flanches, by which the heat is charged and returns to the generater; *v*, *v*, *v*, are rollers, on which the cloth may be wrapt alternately; *w*, *w*, *w*, *w*, are carrier rollers placed across the heated case, to allow the cloth to pass freely over the surface, and may or may not be used, as the strength or delicacy of the fabric may require.

"Fig. 6, represents a section of the generater, and its application to heating a cylinder, or other form of vessel to be applied to manufacturing purposes, to be hereafter described. The generater A, is assumed to be in all cases kept entirely full of the fluid or liquid to be heated, and which is intended to be the medium of transmitting heat to the various purposes to which it is applied. That fluid will in most cases be water, or it may be oil or other liquids, whose boiling points range much higher on the scale of Farenheit. The generater A, being full of the fluid or liquid to be heated, also the pipes B, and the cylinder C, as the process of heating proceeds, the heated fluid or liquid will pass from the top of the generater A, along the pipes, in the direction of B, to C, and slightly cooling in its progress; the colder particles will pass from and along the pipe D, and will return to the bottom of the generater A, at *c*, by which means a constant circulation of heat through the heated fluid or liquid will be kept up. This is a plain and obvious application and illustration of the principle of conducting heat by fluids or liquid. The pipes B, and D, may be made of any shape or form that circumstances may require; and the cylinder C, may be either stationary, as in fig. 4, or made to move by wheels and pinions (or other means), as hereafter described in the figs. 7, 8, 9, and 10. A steam tight and

packed joint is described at E, E, in fig. 6, by which it is obvious that the cylinder C, may be put in motion, while the pipes B, and D, remain stationary. The construction of these packed joints are so distinctly represented by the drawing at E, E, that any competent machinist may construct the same without further description. This application of the principle of conducting heat by fluids will apply to the calender with beneficial effect; and any required degree of heat may be had on the surface of the calender roller with convenience. The apparatus described in fig. 6, will apply with little modification to calendering, and may be advantageously adapted to any of the machine calenders in common use, which will greatly assist in straining, polishing, glazing and finishing cottons, silks, linens, woollen, or other piece goods requiring this process. By an apparatus similar to figs. 6, and an adaptation of the needful pipes, heat may applied in the woollen manufactures to the process of washing and scouring, and cylinders or vessels of wood or iron may be heated to the required temperature. The stewing process may be performed by an adaptation of the apparatus in fig. 6, by the same apparatus adapted to the object heat may be applied to the fulling mill, using a case or lining instead of a cylinder; and the heating of furnaces for dying effected in the same way. The same apparatus, fig. 6, will also apply to the generating of heat for the vats and furnaces of manufacturing chemists and bleachers; the peculiar arrangement required for such objects will arise out of the circumstances of each particular case of application, preserving and adhering to the principle of entire circulation of the heated fluid or liquid, as illustrated in fig. 6. A drying stove upon the plan suggested in fig. 3, and heated by the generater, as described in fig. 1, will apply to gunpowder and other manufactures, where security and risk from accident by fire is the primary consideration.

" Figs. 7, and 8, represent the two sides of a machine for brushing, pressing and finishing woollen cloths. 1, 1, 1, 1, is

the cast iron frame on which the machine is mounted, and 2, is a shaft placed across the entire machine, and to which is affixed a fast and idle pulley, or any other apparatus by which the machine may be put in motion; 3, is a pinion on the shaft 2, working into and moving the wheel 4, on the end of the heated cylinder C; 5, 5, are wheels on the end of the roller-shafts 6, 6, and which are put in motion by the wheel 4, on the axis of the heated cylinder C. The rollers 6, move the rollers 7, 7, 7, 7, by friction or pressure; F, represents an iron roller smoothly turned to press upon the surface of the heated cylinder C. The cylinder C, may be made of cast iron or other suitable material, and the rollers 7, 7, &c. &c. may be made of wood or iron constructed in the usual way; 8, is a wheel on the central shaft 2, which works into and moves the wheels 9, 9, on the ends of the brushes H, H, with considerable velocity; 10, 10, are levers from which is suspended a weight to press the rollers 7, 7, on 6, by which the cloth is firmly held during the operation of brushing, &c. &c.; 11, 11, are screws to press the roller F, on the cylinder, and by which the operation of pressing is performed at the same time with that of brushing; 12, 12, represents three smooth iron rollers by which the cloth is strained and held tight in passing to the friction rollers 7, 7, and 6; 13, 13, represents a circular lining or case of wood, so placed as to receive the cloth as it descends from the friction rollers 7, 7, and 6, and it is made smooth in the inside, so that the cloth may receive no injury as it passes during the operation.

"The operative parts of this machine being thus described, it may be needful to state that the cloth to be acted upon is placed in the circular lining or case 13, 13, and passes over and under the rollers 12, 12, in the direction shewn in the drawing, over the friction rollers 7, 7, to the brush H, then to the heated cylinder C, over which it passes under the roller F, then descends in the same way over the other brush H, to the friction rollers and the wood case 13, the operation is carried

on successively until completed. Heat is applied to the cylinder C, by the apparatus described in fig. 6, and the surface of the heated cylinder may be raised to the desired temperature, and being uniformly pressed by the roller F, through its entire length; the process of hot pressing, brushing, and polishing or finishing, is thus performed at the same time and by one operation. Steam or hot water may be applied during the operation to the surface of the cloth, by which the cloth is polished, and a superior lustre is raised on the surface. The heated cylinder may be moved with more or less velocity at the option of the user, or as experience shall suggest; and the same remark will apply to the brushing cylinder; the above proportions are such as may be applied to advantage.

Figs. 9, and 10, represent the side view of a machine, being another application of the heating apparatus to dressing and cleansing, or moizeing woollen cloths; 15, 15, 15, represents the cast iron or wood frame on which the machinery is mounted; 16, is a pinion on the axis L, extending across the centre of the machine, and having placed or fixed on the end of the same internal and external friction wheels, or a fast and idle pulley, by which motion is communicated to the entire machine; the pinion 16, takes into and moves the wheel 17, fixed on the heated cylinder M; N, is a roller of wrought or cast iron, of the same length as the heated cylinder, and both are smoothly turned on the surface. The axis of the heated cylinder is fitted with flanches, which are adapted to join the pipes at the steam packed joints, as shewn at E, E, fig. 6, by which means the cylinder is heated to the required temperature; 18, is also a wheel on the axis O, acted upon and moved by the pinion 16; 19, 19, are wheels acted upon and moved by the wheel 18, which give motion to the cloth rollers 20, 20, on whose axis they are placed, so as to move freely and independently when out of gear; on the axis of the cloth rollers 20, 20, ratchet coupling wheel are placed, which by teeth, take

into corresponding teeth on the side of the axis of the wheels 20, 20.

"These ratchet wheels are moved in and out of gear alternately as the cloth passes during the operation, from one to the other roll, the change being effected when the cloth has reached the extremity of the length; 21, is a lever moving on a centre 22, by which the wheels are thrown in and out of gear, or remain neutre, at the option of the operator, and as circumstances may require; 23, 23, are brushes of wire, or of bristles, or any other suitable material, or one or both, may be formed after the usual construction of the gig mill cylinder, with boards to receive the teazles or wires of any peculiar make, or adaptation to the purposes of dressing cloth, and these may be moved with the required velocity by changing the wheel 28; 24, 24, are friction wheels fixed on the ends of the axis of the cloth rollers 20, 20; 25, 25, are levers to which a weight is attached, and by which the friction wheel is retarded in its motion, and held steady when the wheel 19, is out of gear. The levers 25, 25, are joined to the large lever 26, by chains at each end, and as the ends of the lever 26, rise and fall, the levers 25, 25, will alternately act upon the friction wheels, 24, 24, and at the same time the depression or elevation of the lever 26, will operate upon the lever 21, and throw it in or out of gear, as the case may require, and this is effected by alternate cams fixed on an upright bar; 28, is a wheel on the end of the axis L, and operates upon and moves the wheels at the ends of the axis P, P, on which the brushes of wire or bristles, or the gig mill cylinder is firmly attached and fixed, and which is moved with the requisite velocity; 30, 30, are friction rollers to give greater or less action of the teazles or wires upon the cloth; 31, 31, are screws to give pressure to the roller N, if required.

Another arrangement of machinery may here be described, and heat be applied to the cloth during the operation of dres-

sing or raising the pile, by which the action of the teazles, brushes or wire in the gig mill will be greatly assisted, and a double gig will be formed. In moizeing or cleansing woollen cloth the successive charges of water will be assisted by the application of heat, which may be raised to any required temperature.

Fig. 9, represents the exterior ring of a gig mill; 33, 33, are the boards of the gig mill, on which the teazles or wires rest and are supported; between these boards a roller 34, 34, of copper, or any other suitable material may be inserted of about four inches diameter, more or less, which being suspended on their own axis, will move by the pressure of the cloth on the gig mill, or in the space between the boards may be inserted a convex tube or case or copper, fixed to and on the ring of the gig mill, as seen at 35, 35, fig. 9. These rollers or tubes may be heated as follows; viz. at the axis of the gig cylinders P, through a steam packed joint connecting with a case of copper of cast iron. This case has a hollow space of about two inches, and is of sufficient diameter to extend to and support the copper rollers, which are inserted in the side of the case through a stuffing box, or other packing to prevent leakage. The hot fluid being charged at the axis P, through a steam packed joint from a generator, as described at fig. 6, the hollow case on the axis will communicate the heated fluid to the copper rollers or tubes, which will pass through the hollow axis of the rollers or tubes, along the entire width of the gig mill, and descend by a similar case at the other end of the axis, and will pass through a steam packed joint, and return to the generater, as shewn at fig. 6. This heat may be applied to the gig mill in common use, and two, four, or more heated rollers may be applied during the operation of dressing cloth at the same time the teazles or wires are performing their operations."

The operation is by folding or winding the cloth on the cloth roller 20, passing it in the direction shewn in the drawing

over the gig mill cylinder or brush, or the heated cylinder, then forward to the other brush or gig mill cylinder, to the cloth roller 20, and when the cloth has run through its entire length, it returns back to the other cloth roller as heretofore described, and the operation is repeated until complete.

"In the apparatus and machinery before described, I claim solely as the subject of my invention, the application of heat conducted by a circulating fluid or liquid, through an apparatus of any construction, to the several useful purposes herein-before stated whatever, may be the fluid or liquid used, or the particular form or combination of machinery employed for effecting such purposes, but I do not claim any of the parts of such apparatus or machinery. Fluids or liquids form a more convenient medium for conducting heat than any other means; I therefore claim as my invention solely the application of heat conducted by a circulating fluid or liquid, to the manufacture of woollen and other cloths; and also the other objects contemplated under any modification of construction calculated for the general application of the principles of circulation, as stated at fig. 6. This form of construction will admit of considerable variation; but the principle on which the invention is founded as above, is that of causing the heated fluid to circulate freely, and as it cools in its progress to return to the generater for fresh supplies of heat; which operation would continue until the whole fluid is of equal temperature, but which can never be the case so long as the heat is passing by radiation from the surfaces intended to communicate heat to the useful objects and purposes herein-before stated.

[*Inrolled in the Rolls Chapel Office, August*, 1829.]

Specification drawn by the Patentee.

To Gabriel de Soras, *of Leicester-square, in the county of Middlesex, Gentleman, and* Stacey Wise *and* Charles Wise, *of Maidstone, in the county of Kent, Paper-makers, in consequence of a communication made to them by a certain Foreigner residing abroad, for an Invention of certain Improvements in sizing, glazing, and beautifying the Materials employed in the Manufacture of Paper, Pasteboard, Bristol-board, and other substances*—[Sealed 21st August, 1827.]

For the purpose of sizing paper it is proposed to employ a fluid compound of alkalies dissolved in water, with bees' wax and alum. The mode of preparing this size is by first making a ley of quicklime and alkaline salts, such as pearlash, potash, or carbonate of soda, which are to be dissolved in water in a wooden vessel—deal is to be preferred; the strength of the ley may be known by its specific gravity. It is proposed to use it for the present purpose at 104, distilled water being 100.

Any quantity of this ley being put into a copper boiler, and made hot, add to it as many pounds weight of fine bleached bees' wax, as there are pounds of the ley, and boil them well for some hours. But it is considered that steam heat will answer better than fire.

When the wax is properly dissolved and mixed with the ley, introduce four gallons of boiling water for every pound of wax, and let them be well stirred until fully combined. If the wax be not perfectly dissolved before introducing the boiling water, a small additional quantity of alkali should be employed, which will effect the object.

To the fluid thus prepared a quantity of the farina of potatoes is to be added, or potatoe starch, in the proportion of four pounds of the flour in a dry state to every

pound of wax; and this, when properly incorporated and become cold, constitutes a size suited to the purpose under consideration.

The Patentee says that he proposes the employment of potatoes, or potatoe starch, only in consequence of its cheapness, as other farinaceous matter would do equally well; and he states that the potatoes are prepared by boiling and bruising them, and after straining the farina from the skins and fibrous matters (which are thrown away), the water is evaporated, and the flour dried in any convenient manner.

The size formed as above, is to be mixed with the rags which constitute the pulp in the vat, in the way that size is commonly introduced, when the paper is not intended to be sized in sheets, and with it is to be used a quantity of alum dissolved in the water and size contained in the vat. The proportions of alum to the other materials will depend upon circumstances, which will be known to paper makers, and therefore need not be particularly stated.

Paper thus sized in making, will, when pressed in sheets, assume a glossy and beautiful appearance. The mode of pressing may be nearly the same as is commonly adopted by paper-makers. Sometimes the Patentee presses the sheets between sheets of unsized paper, which has been steeped in a strong solution of alum, and at other times he presses them between felts which have been so steeped. These felts will require to be frequently washed, for the purpose of cleansing them from the size which they may take up by the operation.

The sheets of paper will require to be opened and separated at least twice during the pressing process, and when dried will be found to possess a beautiful gloss, as above said.—[*Inrolled February*, 1828.]

To ROBERT GRIFFITH JONES, *of Brewer-street, Golden-square, in the county of Middlesex, in consequence of a communication made to him by a certain Foreigner residing abroad, for an Invention of ornamenting China and other compositions, which he denominates letrophanic, translucid, or opaque China.*—[Sealed 13th March, 1828.]

THE subject of this Patent is a curious ornamental china, on which any device is depicted, by rendering parts of the china thick and opaque, and other parts thin and transparent, so that when held up against the light the device is seen in black and white by the difference of light and shade.

The invention is capable of being applied to any semi-transparent material, such as glass, when rendered partially opaque, and may be considered a sort of embossed or modelled pottery ware, on which subjects are represented by relief, or rather by counter-relief.

The mode of making this picturesque china, as described by the Patentee, is by forming a mould or model of the subject in bas-relief, and then pressing the plastic clay, of which the china is to be made, upon the model, when an impression being given upon the clay from the mould, the picture is produced, and becomes permanent when the clay is dry.

To form the mold the artist who designs the subject spreads upon a tablet of glass a thick coat of wax, and when set, he cuts away the wax, or adds to its substance, so as to vary the thickness, and produce the desired effect of light and shade, when the light passes through it. It is obvious that where the darkest parts of the picture are to be, there must be the greatest substance of

wax, and where the lightest part, there the wax must be thinnest. In this way, by the ordinary operation of modelling in wax, the design is first formed, and the subjects may be very well defined by cutting the wax sharp at those parts where a bold outline is required. It will be perceived that this kind of modelling is nearly the reverse of the ordinary process, for in this all the light parts are cut out, instead of being raised.

The wax design being thus prepared, a cast of plaster of Paris is taken, which will be a reverse, and on this a pewter model is cast, which is to be the instrument for moulding the china upon.

Should any of the parts be imperfect, or the outlines not sufficiently clear, the plaster and the metal moulds may both be amended, by cutting with a sharp tool, which of course must be done with care, and by a person who has knowledge of the effect which will ultimately result.

On this metal mould the plastic clay being moulded, it is allowed to dry into the form of what is technically called biscuit; it is then baked, and treated in the ordinary way that china is made, and when finished has the effect of a transparent Indian ink drawing.

[*Inrolled May*, 1828.]

To William Brunton, *of Leadenhall-street, in the city of London, Civil Engineer, for his having invented certain Improvements on Furnaces for the calcination and sublimation, or evaporation of Ores, Metals and other Substances.*—[Sealed 21st Feb. 1828.]

This invention consists principally in the employment of a furnace, with a revolving bed or bottom upon the same principle of construction as the surfaces for steam boilers,

invented by the present Patentee, and for which a Patent was granted to him in 1819, (see Vol. I, of our First Series, page 86.)

It is proposed to erect a circular furnace having the fire-place on one side, and the flue or chimney on the opposite side, with a dome top, rather flat, and a bed constructed of fire bricks, mounted upon a horizontal wheel, which shall revolve upon a perpendicular shaft passing up the middle of the furnace.

In the centre of the dome top a hopper is to be inserted, from whence the ores are allowed to fall continually in small quantities, on to the middle of the bed, which is made slightly conical, inclining downwards towards the circumference.

The bed which constitutes the leading features of novel construction in this calcining furnace is formed by mounting an iron wheel, with many arms, horizontally upon a spindle or shaft, supported in a step at bottom, and in cross arms or bearings at top of the furnace. A flange or rim on the periphery of the wheel fits closely into a semicircular iron ring, placed within the circular building, and the edges are luted or rendered air tight by sand spread round.

The upper side of the wheel, which is to constitute the bed of the furnace, is covered with Stourbridge clay, or fire bricks, and is made nearly flat, but slightly rising in the middle.

Rotatory motion may be given to this circular bed by various means. An endless screw, or a pinion working into a circle of teeth on the under side of the wheel, is proposed; which may be actuated by any moving power that can be conveniently applied; and the speed may be regulated according to circumstances.

The flame and heat of the fire placed on one side of the

furnace being conducted across by the draft passing up the chimney or flue on the opposite side, the interior will become heated, and the ores falling from the top will spread themselves upon the bed, and become roasted, calcined, or sublimated, as the bed revolves.

At that part of the furnace where the ore, on arriving, is supposed to have received sufficient roasting, scrapers are placed for the purpose of discharging it into a receiving vessel below. These scrapers are straight pieces of iron set obliquely, so that as the bed of the furnace revolves, the oblique scrapers, acting one after the other ultimately pushes the ore off the bed, and causes it to fall down a hole into the receiving vessel.

There is an opening provided for a man to pass in for the purpose of examining the wheel work, but that must be closed when the furnace is at work.

The rotatory movement of the bed also moves the lower part of the hopper, by which the ore is disturbed, and portions of it allowed to fall down on to the bed.

The Patentee does not claim the construction of the furnace in any of its parts, but merely the employment of a revolving bed and scrapers, for the purpose of calcining or subliming ores in the way described.

[*Inrolled April,* 1828.]

To William Pownall, *of Manchester, in the county of Lancaster, Weaver, for his new invented Improvements in making Healds for weaving purposes.*—[Sealed 6th March, 1828.]

There are two methods proposed by the Patentee of forming the healds for weaving; the first is by tying the knots of the cords or heald yarns alternately above and

below, so as to prevent the knots from obstructing the free passage between the healds; the second is by constructing the healds of cloth, or such material woven in a peculiar way.

The method of forming the first kind of heald is by providing a bench, as many feet in length as the intended heald is to be wide, and of a width equal to the height of the intended heald. Blocks are to be placed at each end of the bench, for the purpose of supporting the two rails of the heald which is about to be formed, and raising them up a few inches, that the hands of the workmen may pass conveniently above and below. A rod is to be placed along the bench, resting upon the blocks, midway between and parallel to the two rails.

Two workmen are now to be seated, one on each side of the bench; one passes the heald cord over the rail on his side, and over the rod, and bringing it back to the rail, secures it; the other passes his cord in a similar way over the rail on his side, and through the loop formed by the first cord, then ties the knot to make the cord secure. The second workman then passes a cord from the rail over the rod and back again, and the first workman carries a cord from his rail through the loop, and then makes it fast by a knot. Thus the cords of the heald are alternately tied on the upper and under side of the rod, which is to form the eye. This constitutes the first improvement.

In making the healds of woven cloth, the mode proposed is to weave in a loom, a cloth or material made by shoots of suitable yarn in a warp of a length just sufficient to reach from one headle or heale rail to the other.

In weaving this material, a few inches of strong yarn is first to be shot through the warp, then a finer yarn, and then worsted, which being elastic, is to receive the eye of

the heald for guiding the warp thread or yarn when the heald is made and applied. Next to the worsted some shoots of fine yarn are to be placed, and then the strong yarn as before.

The fabric thus made is to be properly stiffened, and then cut into strips of one tenth of an inch each, which strips being tied up to the heald rails, constitute the improved heald of the second kind proposed under this Patent.—[*Inrolled July*, 1828.]

Novel Inventions.

Locomotive Carriages.

Mr. Gurney has at length completed a carriage, which by the mechanical power of steam, has performed a journey to Bath in one day. We are not yet made acquainted with the particular modifications of machinery latterly adopted by this gentleman, but we congratulate him on having, by great perseverance, perfected a locomotive engine, capable of running upon ordinary roads. We understand that the engine and boiler, or locomotive part of the apparatus, is now attached to the carriage, and may be considered as a steam horse. This arrangement is certainly preferable to placing the boiler and engine in immediate contact with the carriage, which is to convey goods and passengers; and if ultimately found capable of being brought into public use (for we consider this journey merely as an experiment), it would probably be most convenient and desirable that several of these locomotive engines should be employed on one line of road, in order that they might be exchanged at certain stages for the purpose of examination, tightening of screws, and other ad-

justments, which the jolting on passing over the road might render necessary, and for the supply of fuel and water. We are, however, very doubtful of the economy of using steam, instead of horses, as a travelling agent, and require to be more perfectly satisfied of the practicability of this mode of travelling, before we consider that the construction of an effective steam carriage is really accomplished.

Gas Engine.

THE extraordinary pretensions of Mr. Brown to supersede steam power by the employment of gas, continues to haunt the public like an *ignis fatuus,* exhibiting the most plausible advantages to the view, but in fact without the least approximation to reality. We have continued to observe this invention from the first suggestion of the gas engine proposed by Mr. Brown, and described in the eighth vol. of our First Series, until the present time, and at this moment see no reason to alter our original opinion, thai though an effective engine is really produced, working by the agency of gas, yet we feel perfectly satisfied that the advantage of steam, employed as a moving agent, both on the score of economy and power, will always leave gas at an immeasurable distance behind it.

We do not think it necessary particularly to point out the palpable absurdities contained in Mr. Brown's advertisement, but simply to remind him that men of science are not to be gulled by the same sort of charlatanism which might impose upon the vulgar at a village wake.

These gas engines are frequently in action at Brompton, near Kensington, where, we understand, the Patentee invites the public to inspect them daily.

Steam Navigation.

Propelling wheels with revolving paddles appears to be at length coming into use. Three large vessels upon the Seine in France are equipped with revolving paddles, upon the plans of Messrs. Bloomfield and Luckcock, described in the Eleventh vol. of our First Series, and upon that of Mr. Oldham, in our Fourteenth vol. These vessels are principally employed in towing out large American ships from the harbour of Havre de Grace. Their mechanism is concealed with great care from public view, as new, important, and secret inventions, and they are considered to perform with very great economy and advantage over the ordinary paddles.

One of the vessels has steam engines constructed upon Mr. Brunel's plan, in which the cylinders stand upon inclinations, the piston rods tending to the crank shaft, (as described in our Fifth vol.); the other ships have engines of the ordinary construction, and all of them exert very great power, or may be supposed, from the business they are engaged in, and appear to perform in a very satisfactory manner.

AMERICAN PATENT,

FROM THE FRANKLIN JOURNAL.

A Triangular Measure-case Ruler, for delineating garments with. By Allen Davis, Philadelpnia. October 11, 1828.

To make a triangular measure case ruler, for delineating garments, I first procure three strips of tin or other metal plates, with which I form a triangular tube, having the edges of the metal strips turned outside, forming a trough or groove of each strip. I next proceed to solder the three troughs or grooves together, which of course forms a triangular tube, with the troughs or grooves

outwards. I next prepare each side of the triangle for receiving the scales which are to be used therein, by regulating the depth of the groove or trough to the thickness of the scales, and by marking on each side of the triangular tube, some peculiar mark, such as is used in music to denote tunes, flats, sharps, &c. any character will do to know the scales apart by. I have used a sharp to designate the scale of lengths, or heights, of each customer, and have marked the character on the side where the length scale belongs; and on the second side, I have marked the character of a *la*, or, in other words, a hollow square, which denotes the waist scale; lastly, I have marked the third side of the triangular tube with the character of a natural, which denotes the breast scale; and into these three grooves I slide each respective scale, according to the height and thickness of each customer. I also make some triangular measure-case rulers for delineating garments by, of wood, which answer the same purpose, but are not so durable. To make a wooden triangular measure-case ruler for delineating garments with, I take a piece of wood, about two feet long and two inches square, of which I form a triangular ruler; in each side of which I plough a dovetail groove for the scales to slide in. I then put a band of wood or metal round each end, for the twofold or double purpose of holding the marks or characters of each scale, and for a supporter of a wedge with which the scales must be secured, to keep them from sliding back and forth.

REVIEW OF BOOKS.

The Fresh-water Fishes of Great Britain. Drawn and described by Mrs. T. Edward Bowdich. Parts I. and II.

We cannot better resume our notice of new scientific books, than by furnishing our readers with an account of one of the most beautiful works on natural history that has ever appeared in this country. Each part is illustrated with four original drawings by the authoress, made from the fish immediately after they are taken from the water, and according to the account of an ingenious "*brother of the angle*," are perfect portraits of the various species. Of the specimens now before us, the carp, the trout, and the eel are decidedly the most beautiful, and the latter actually appears to glide along the paper that supports it.

Examining the work in a literary point of view, we are delighted by the simple and familiar style of our authoress, who in adopting the system of Baron Cuvier, has shewn a just discrimination of the powers of that able naturalist.

It is a curious fact, and one worthy of record, that at the present time the most accurate observer of optical phenomena, and the only accurate writer on Ichthyology, should belong to that sex which in the last century was considered as only fit to hunt butterflies, or ornament a sampler with their unnatural effigies. The first of these ladies (Mrs. Somerville) has satisfactorily proved that all the visible colours of the spectrum have the power of communicating magnetism to ferruginous bodies; and the latter, by the work before us, has supplied a desideratum that had long been felt by the naturalists of this country.

Transactions of the Royal Society for 1829.

This, which is the last part published by the Royal Society, contains little to interest the scientific world, beyond a paper

by Sir Humphry Davy, written at Lubiana, in Illyria, during the illness which terminated in his death. It relates to the torpedo, and the author proves, by a series of experiments, that there subsists a stronger analogy between common and animal electricity than between voltaic and animal electricity, although the contrary is usually imagined.

An Oration delivered before the Medico-botanical Society.—By John Frost, F. R. S. Edin. F. L. S.

Mr. Frost is director of the Society before whose members the above oration was delivered, and is well known for the extent and importance of his labours in natural history, and we notice this pamphlet but to call public attention to a Society which is likely to be of the greatest possible utility to the medical profession. The Medico-botanical Society now numbers amongst its members nearly all the crowned heads in Europe, yet strange to relate, amongst the class of persons for whom it was especially intended, its existence is hardly known.

The Medico-botanical Society was instituted for the purpose of investigating, by means of communications, lectures, and experiments, the medicinal properties of plants, their botanical characters, and chemical constituents; of promoting the study of the vegetable materia medica in all countries; of collecting and describing the various substances appertaining thereto; of improving their pharmaceutic preparations; of disseminating, by correspondence and publication, such discoveries as may be made of new medicinal plants, and of new uses, or preparations, of those which are already known; of adjudging honorary or pecuniary rewards to the authors of such discoveries; and of cultivating medicinal plants.

These pursuits, which are extremely interesting in themselves, cannot fail to prove of the greatest importance in ex-

tending the knowledge and improving the practice of medicine, and must eminently tend to promote the advantage of mankind. A very extensive correspondence has been established on the Continent, with those who are highly distinguished by their acquirements, and well qualified to further the views of the Society, which has the satisfaction of seeing amongst its members, not only many gentlemen of the medical profession, whose assistance and co-operation is extremely desirable, but also many other persons who are illustrious by their rank, and by their encouragement of science.

French Patents

GRANTED IN APRIL, 1829.

To Messrs. Noel, Glavet, and Son, mechanics, residing at Metz, in the department of Moselle, for 10 years, for a machine to cut and round off the teeth of wheels, of every form and dimension, either in iron, brass, wood, or cast iron. 6th April.

To Messrs. Louis Mallet and Son, clock makers, residing at Paris, Rue Neuf des Petit Champs, for 5 years, for an instrument which they call a revolving leather cylinder, for sharpening razors. 6th April.

To M. Jean Etienne Guijues, morocco leather manufacturer, residing at Grenoble, in the department of Liserre, for 5 years, for the means of applying to leathers and skins all colours and designs. 8th April.

To Mr. William Wayte, of Nottingham, represented in Paris by M. Truffaut, Rue St. Lazare, No. 73, for 15 years, for an invention, improvement, and importation for an apparatus and preparation to produce steam and different gases in an artificial atmosphere, of a much superior pressure and elasticity to the natural atmosphere. 10th April.

To M. Francois, Sen. and the Sieur Favereau, residing in Rue Sullargues, No. 15, at Lareole, in the department of Gerond, for 5 years, for a machine which he calls the "universal lever," to be applied to windlasses, rollers, or to any weights to be moved. 10th April.

To M. Jean Babtiste Shircel, Pierre Cellier, and Jean Babtiste Maltheuse, buckle manufacturers, residing at Rancourt, represented by M. Dertelle, the son, at Charleville, in the de-

partment of Ardennes, for 5 years, for an improvement in brace buckles, girdle buckles, and harness buckles, which he calls "coulants." 10th April.

To Messrs. Deleuze, jewellers, and Dentillet, residing in Paris, Rue Phillipeaux, No. 11, for 5 years, for an instrument to decant bottles, which he denominates "siphon champenois." 13th April.

To Messrs. Gandillott, Brothers, Roy, residing Rue du Porteau, at Besançon, in the department of Douly, for 15 years, for a method of constructing works in rolled iron tubes. 13th April.

To M. Pierre Joachim Reignot, iron master, residing at Aisey le Duc, arondissement of Chatillon sur Seine, in the department of Côle Dór, for an improvement of a Patent granted on the 13th of last December, for 10 years, for a method of converting cast iron into wrought iron, with economy of labour and fuel. 15th April.

To M. Maugeret, ink manufacturer, residing in Paris, Rue de la Marche, No. 12, for 5 years, for a kneading trough, which he calls an "Archimedes' screw kneading trough." 15th April.

To Messrs. Jacques Francois le Maitre, Chansey, merchant, and Jacques Loyeu, spinster, the former residing at Montville, and the latter at Maromme, near Rouen, department of la Sienne inferieure, for an improvement and addition to a patent of importation for 5 years, granted the 25th of May, 1826, to Mr. Winslow, whose grantees they are, for a machine called "nota pottaire, or roving machine, economical and expeditious," for the spinning of cotton without twist, and with the greatest velocity. 16th April.

To M. Francois Henri Mouchons, apothecary, residing at Perpignan, in the department of the Pyrennees Orientales, for 15 years, for a machine which matzapole, for kneading dough. 16th April.

To M. Alexandre Theodore Guilbert, comb maker, residing in Paris, Rue Neuve St. Martin, No. 14, for 10 years, for a method of incrusting, by pressure, on combs of tortoise shell, horn, or ox-hoof, all sorts of designs in relief, plain or cut. 17th April.

To M. Peerchant, Sen. merchant of Morlaix, residing at Madame Brequet's, Rue Richelieu, No. 25, for 15 years, for a machine to replace *les moques anyards* (dead eyes) and *capes de mouton* (shrowds and beams) employed on board ships. 21st April.

To Mr. Weinling, of Petit Heim, Lower Rhine, residing at Paris, Rue St. Joux, No. 23, for 5 years, for portable globes that can be filled with air or emptied at will. 21st April.

To Messrs. Croiset and Dardet, cutlers, residing in Paris, the former Rue de la Poterie, No. 26, the latter Rue de Tassé, Montmartre, No. 9, for 5 years, for an invention and improvement of an instrument to sharpen knives. 21st April.

To Messrs. Durand, dyers, residing at St. Juste sur Loire, for 10 years, for a method of dying all sorts of designs and colours, on silks, woollen, and cotton cloths by pressure. 21st April.

To M. Anthelane Genod, silk manufacturer, residing Rue de Seze, No. 1, at la Guilotiere, near Lyons, department of Rhone, for 5 years, for a machine to be applied to looms, in the manufacture of embroidered cloth. 21st April.

To Messrs. Eugene Mevil, Armangund, and Plaisant, residing in Paris, Rue de Clary, No. 3, for 10 years, for an apparatus for boring ground. 23d April.

To M. Pierre Bonduceau, the son, steel polisher, residing at Aumale, but now in Paris, Passage de Bois de Boulogne, No. 12, for 5 years, for the manufacture of metallic eyelet holes for stays and other purposes. 23d April.

To M. René St. Amand, residing in Paris, Rue des Petits Hotels, No. 30, for five years, for a machine to manufacture wire points, commonly called "clus de piugle." 23d April.

To M. Croiset, silk throwster, residing at Chatte, department of the Isere, for 15 years, for a silk mill, which he calls the expeditious, progressive, and regular. 23d April.

New Patents Sealed, 1829.

To George Straker, of South Shields, in the county of Durham, ship builder, for his invention of an improvement in ship's windlasses. 25th July—2 months.

To Louis Quetin, of Great Winchester Street, in the city of London, professor of mathematics, in consequence of a communication made to him by a certain person residing abroad, for an invention of a new or improved vehicle or combination of vehicles for the carriage or conveyance of passengers; and also luggage and goods, constructed upon a principle of security against over-

turning or upsetting, and possessing other advantages which he conceives will be of public utility. 25th July—6 months.

To Francis Horatio Nelson Drake, of Clayton House, in the county of Devon, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, of certain improvements in tiles for covering houses and other building. 25th July—6 months.

To John Nicholls, of Pershall, in the county of Stafford, gentleman, for his invention of certain improvements in the lever and the application of its power. 25th July—2 months.

To Joshua Bates, of Bishopsgate Street, in the city of London, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, being possessed of the knowledge of an improved method of constructing steam boilers or generators, whereby the bulk of the boiler or generator, and the consumption of fuel are considerably reduced. 1st August—6 months.

To Joshua Bates, of Bishopsgate Street within, in the city of London, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, being in the possession of a new process or method of whitening sugars. 1st August—6 months.

To John Hutchinson, of Liverpool, in the county Palatine of Lancaster, merchant, for certain improvements in machinery for spinning cotton, silk, linen, woollen and other fibrous substances, which improvements have been communicated to him from a certain foreigner residing abroad. 30th July—6 months.

To Thomas Hall Rolfe, of Cheapside, in the city of London, musical instrument maker, for his new invented improvement or improvements upon the self-acting pianoforte. 11th August, 6 months.

To Nathaniel Jocelyn, of Newhaven State, Connecticut, in North America, now residing in the city of London, artist, in consequence of a communication from foreigners residing abroad, and from much study of his own, for an invention of certain improvements in the preparation or manufacture of blank forms for bankers' checks, bills of exchange, promissory notes, post bills, and other similar instruments or securities for the exchange of payments of monies, by which forgeries and alterations in the same are prevented or detected. 3d August—4 months.

To Thomas Bailey, of Leicester, frame smith, for his having invented certain improvements in machinery for making lace. 5th August—6 months.

To Thomas Brown, of Birmingham, in the county of Warwick, coach maker, for his having invented an improved coach, particularly adapted for public conveyance and luggage. 5th August—6 months.

To William Shand, of the Burn in Kincardineshire, in that part of the United Kingdom called Scotland, Esquire, for his having invented a certain improvement or improvements in distillation. 10th August—6 months.

To John Mac Leod, Esquire, of Westminster, surgeon on the Madras Establishment, for his having invented improvements in preparing or manufacturing certain substances, so as to produce barilla. 10th August—2 months.

To James Rowland, of Heneage Street, Brook Lane, Spitalfields, in the county of Middlesex, and Charles M'Millan, of the same place, engineers and millwrights, for their having invented a new or improved process or mode of constructing, forming, or making street ways, carriage roads, and high ways in general. 11th August—6 months.

To Edward Weeks, of King's Road, Chelsea, in the county of Middlesex, horticultural builder, for his having invented certain improvements in raising, lowering, or conveying heated water, or other fluids, to various distances. 14th August—6 months.

To Henry Cruger Price, and Charles Fox Price, of the city of Bristol, ironmongers, for their having invented or found out an improvement in and upon certain apparatus already known for the communicating of heat by means of the circulation of fluid. 20th August—6 months.

To John Mushet, of York Square, Regent's Park, in the parish of St. Pancras, in the county of Middlesex, gentleman, in consequence of his father William Mushet, late of the city of York, doctor of medicine, and a Member of the Royal College of Physicians, deceased, having discovered a certain medicine, which in the course of his practice he found of essential and peculiar benefit in gouty affection of the stomach, spasms, cramp, inflammation of the lungs, violent and confirmed coughs, pains after child birth, and in other pains in the breast and bowels, beyond any other medicine or application in like cases. 20th August—2 months.

To John Jones, of Leeds, in the county of York, brushmaker, for his having invented or found out certain improvements in machinery or apparatus for dressing and finishing woollen cloths. 21st August—6 months.

To William Roger, of Norfolk Street, Strand, in the county of Middlesex, Lieutenant in the Royal Navy, for certain improvements in the construction of anchors,—21st August—6 months.

To William Shand, of the Burn, in Kincardineshire, in that part of the United Kingdom called Scotland, Esq. for a certain improvement or improvements in distillation and evaporation. 21st August—6 months.

CELESTIAL PHENOMENA, FOR SEPTEMBER, 1829.

D.	H.	M.	S.	
1	7	0	0	☽ in conj. with θ in Virgo.
2	15	0	0	☽ in conj. with η in Virgo.
4	7	0	0	☿ in conj. with β in Virgo.
4	8	0	0	☽ in conj. with γ in Libra.
4	17	0	0	☽ in conj. with δ in Libra.
5	0	0	0	Clock before the ⊙ 1' 26"
5	10	0	0	☽ in conj. with φ in Oph.
6	0	0	0	☽ in □ first quarter.
9	8	0	0	☿ in conj. with η in Virgo.
9	13	0	0	☽ in conj. with β in Capri.
10	0	0	0	Clock before the ⊙ 3' 8"
11	12	0	0	☽ in conj. with θ in Aqua.
12	18	29	0	Ecliptic opposition, or ● full moon.
12	17	25	0	Moon partly Eclipsed — Beginning.
12	18	37	0	Moon partly Eclipsed — Middle.
12	19	49	0	Moon partly Eclipsed — End.
15	0	0	0	Clock before the ⊙ 4' 52"
15	2	0	0	☾ in conj. with ο in Pisces.
17	19	0	0	☾ in conj. with γ in Taurus
17	20	0	0	☾ in conj. with 1δ in Taurus
17	20	0	0	☾ in conj. with 2δ in Taurus
18	1	0	0	☾ in conj. with α in Taurus.
19	12	6	0	☾ in □ or last quarter.
20	0	0	0	Clock before the ⊙ 6' 38"
20	8	0	0	♂ in conj. with σ in Leo.
21	16	0	0	☿ in conj. with α in Virgo.
22	20	17	0	⊙ enters Libra.
23	18	0	0	☾ in conj. with ξ in Leo.
23	23	0	0	☾ in conj. with ο in Leo.
24	8	0	0	♀ in conj. with λ in Virgo.
24	9	0	0	☾ in conj. with π in Leo.
25	0	0	0	Clock before the ⊙ 8' 21"
26	7	0	0	☾ in conj. with τ in Leo.
26	19	0	0	☾ in conj. with β in Virgo.
27	14	3	0	Ecliptic conj. or ● new moon
28	13	0	0	☽ in conj. with δ in Virgo.
29	21	0	0	☽ in conj. with κ in Virgo.
30	0	0	0	Clock before the ⊙ 10' 1"

☽ the waxing moon.—☾ the waning moon.

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR JULY AND AUGUST, 1829.

1829.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hight.	Low.	
July 26	59	52	30,12	29,92	,35
27	69	49	30,12	30,01	1,
28	70	38	30,01	29,90	
29	67	51	29,66	29,61	,025
30	70	46	29,72	29,66	,3
31	67	47	29,99	29,78	
Aug. 1	68	42	30,12	30,10	
2	73	43	30,22	30,13	
3	66	49	30,00	29,88	
4	62	45	29,76	Stat.	,325
5	65	48	29,94	29,77	,475
6	69	45	30,00	29,88	
7	72	56	30,12	30,06	,1
8	78	50	30,19	30,17	
9	74	51	30,06	29,96	
10	69	57	29,86	Stat.	,175
Aug. 11	66	45	30,05	30,00	,2
12	70	45	30,00	Stat.	
13	75	55	29,75	29,66	
14	63	54	29,50	29,36	,125
15	64	50	29,69	29,50	,475
16	60	47	29,99	29,83	,475
17	67	38	30,06	30,00	,05
18	67	49	29,83	29,60	
19	66	53	29,50	29,40	,25
20	60	50	29,47	29,24	,85
21	64	45	29,72	29,93	,025
22	63	45	29,98	29,60	
23	68	55	29,50	29,46	,3
24	59	54	30,00	29,23	,275
25	63	45	29,80	29,80	,175

Edmonton. C. H. ADAMS.

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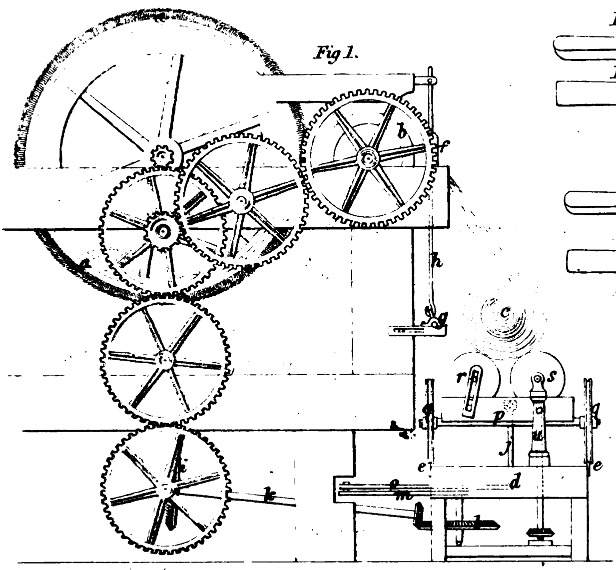
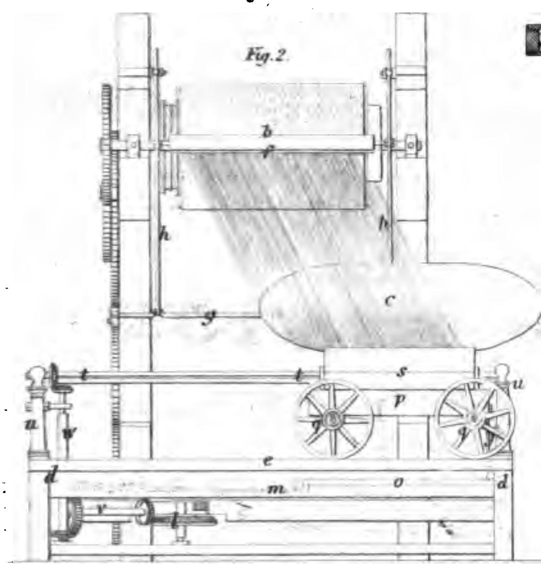
SECOND SERIES.

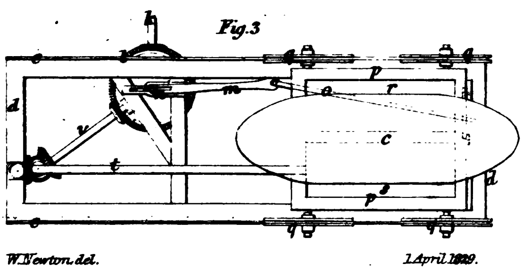
LIST OF PLATES TO VOL. III.

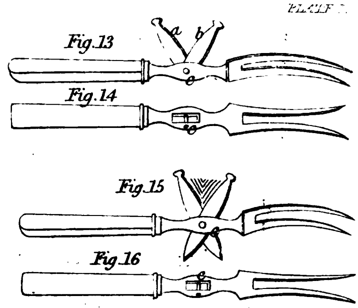
SECOND SERIES.



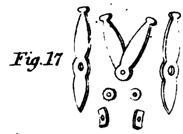
Moores Hat Making Machine



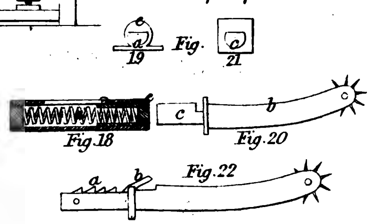


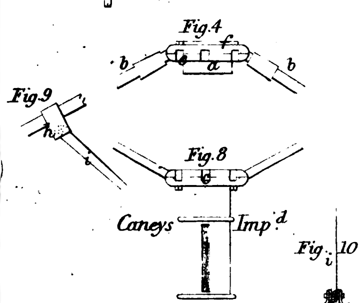


Rogers & Comp.s Improved Table Forks

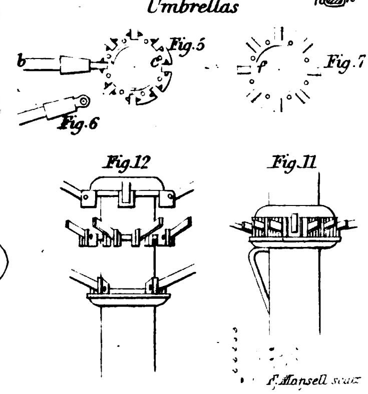


Weiss's Imp.d Spurs



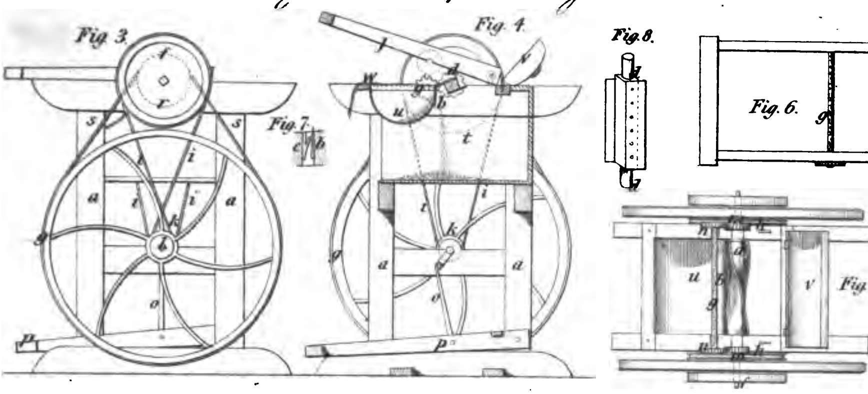


Caneys Imp.d Umbrellas



W. Newton del. 1 April 1829. J. Mansell sculp.

Baring's Machine for cutting Fur.



Williams's Machine for planking Hat-bodies.

Fig. 1.

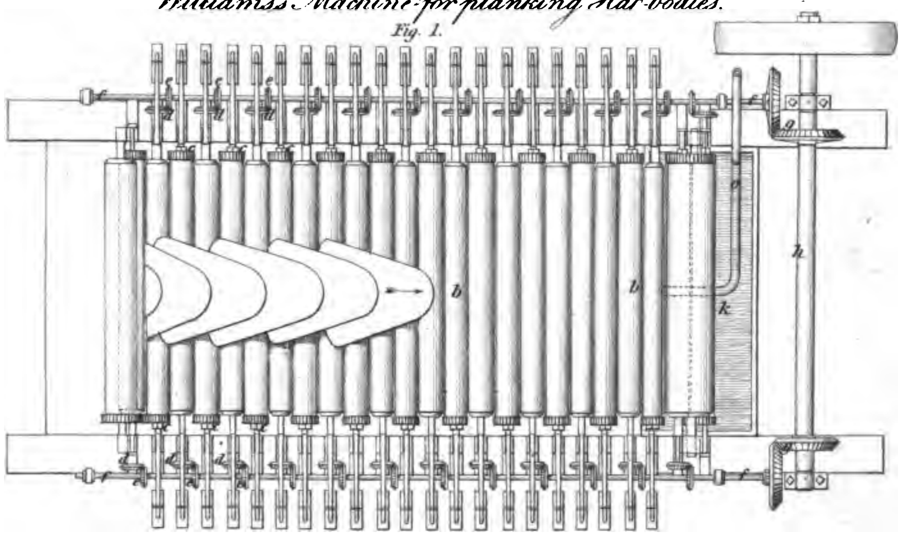
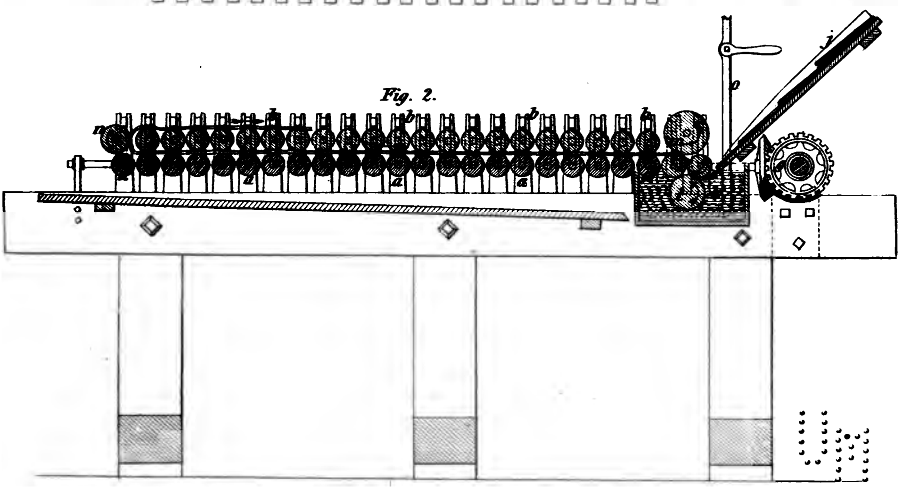


Fig. 2.



W. Newton del. 1st April 1829. T. Phillibrow

Wilson's Distilling Apparatus

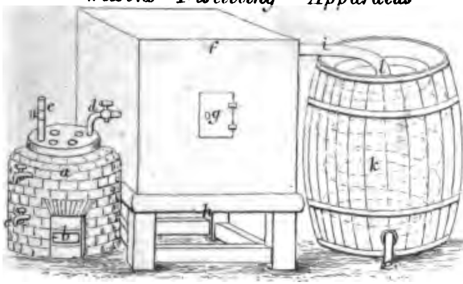


Fig. 9.

Riley's Safety Travelling Carriage

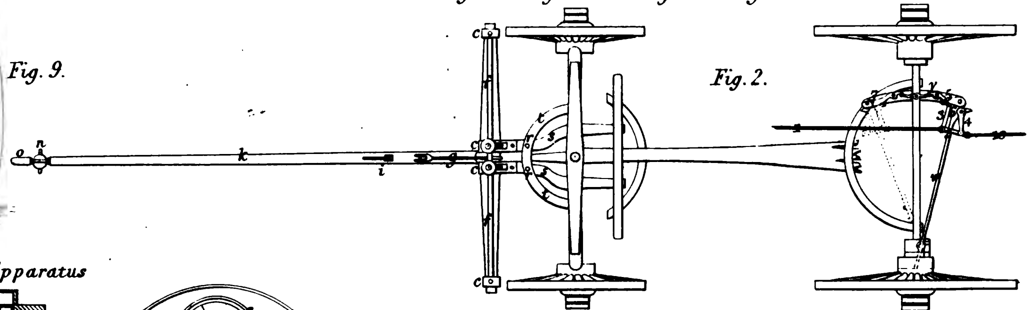


Fig. 2.

Stratton's Warming Apparatus

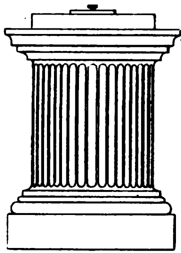
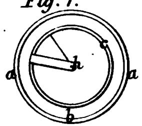


Fig. 5.



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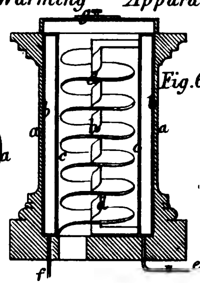

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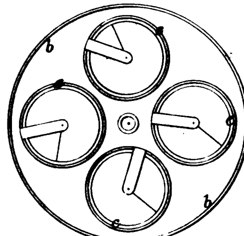

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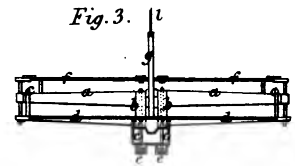

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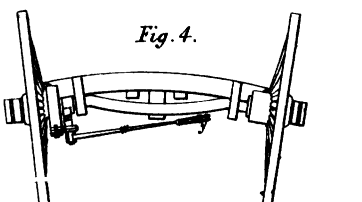


Fig. 4.

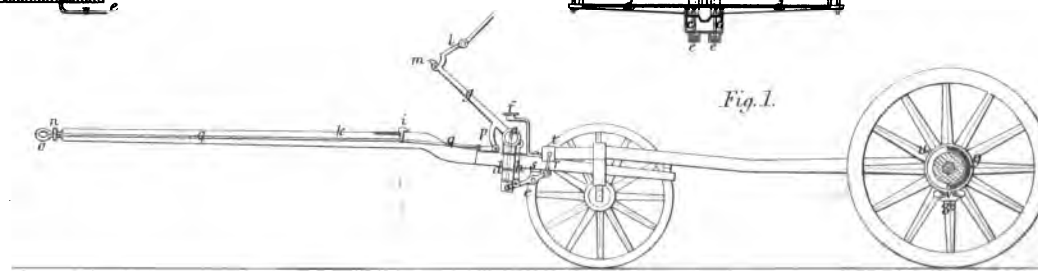
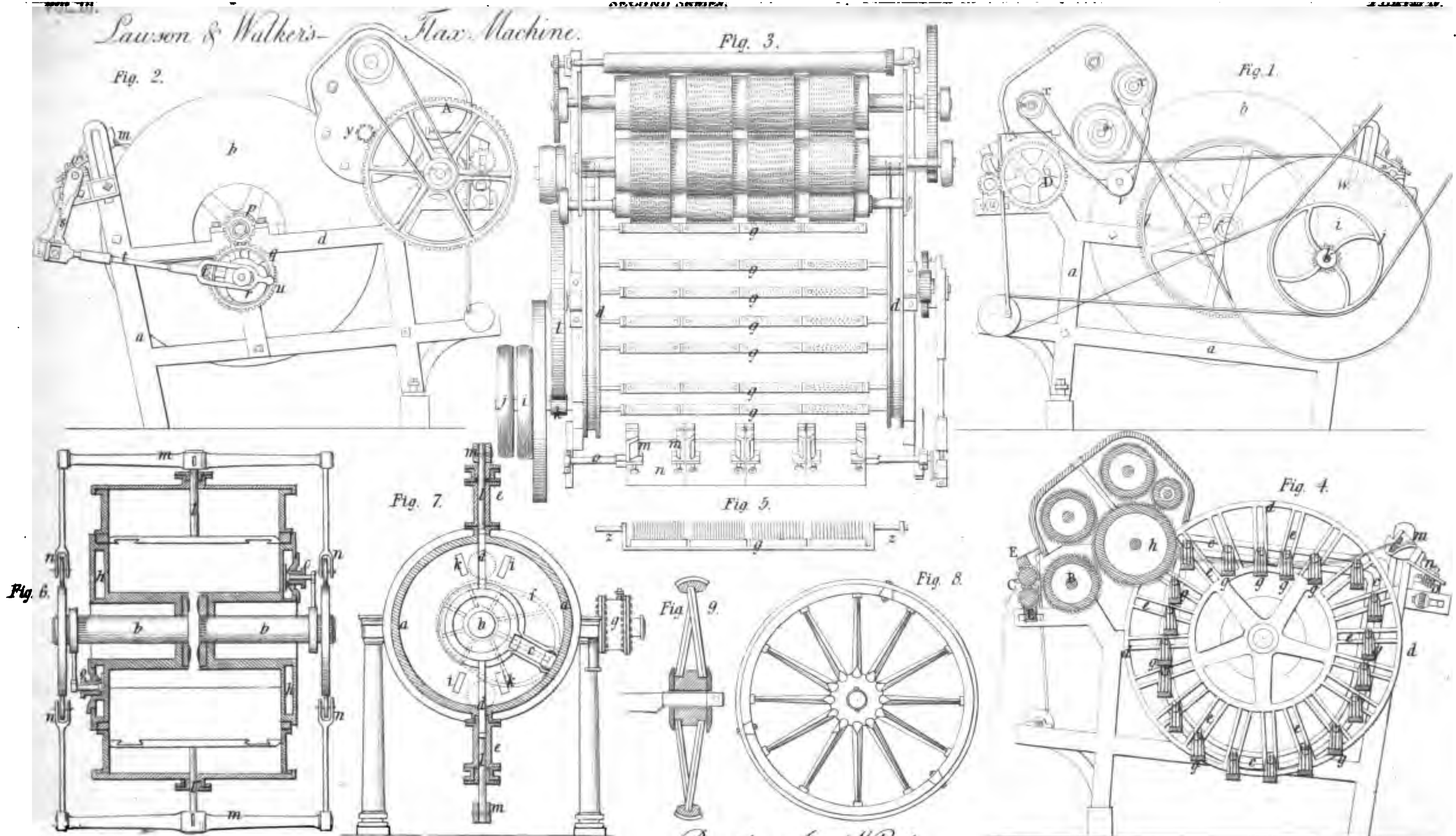


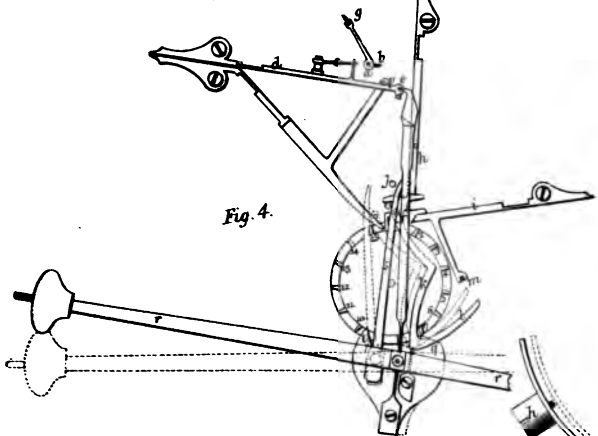
Fig. 1.

Wm. Newton del. 1 May 1829. F. Mansel sculp.



W. Newton Delt. Galloway's Rotary Steam-Engine. Bentley's Impd. Wheel. L. May. 1829. T. Phillibrown Sculp.

Ulrich's Improved Chronometer.



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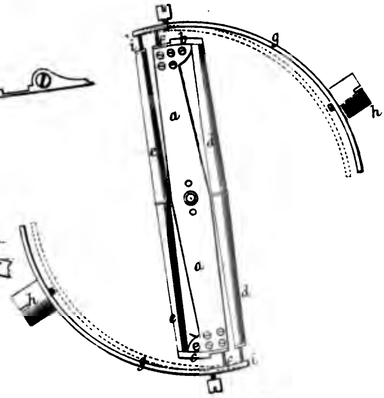

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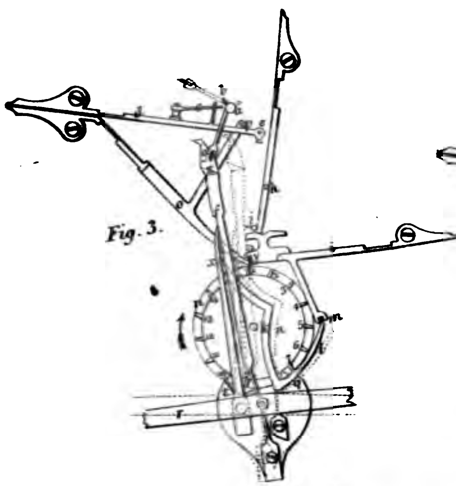

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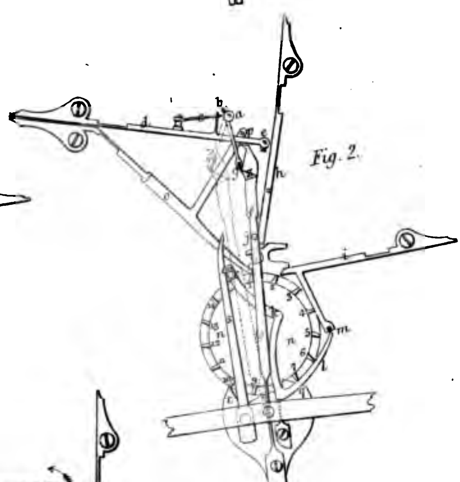

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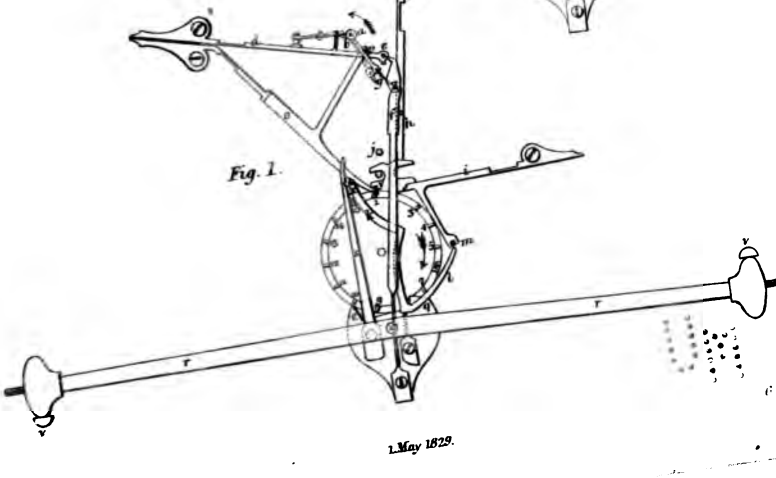
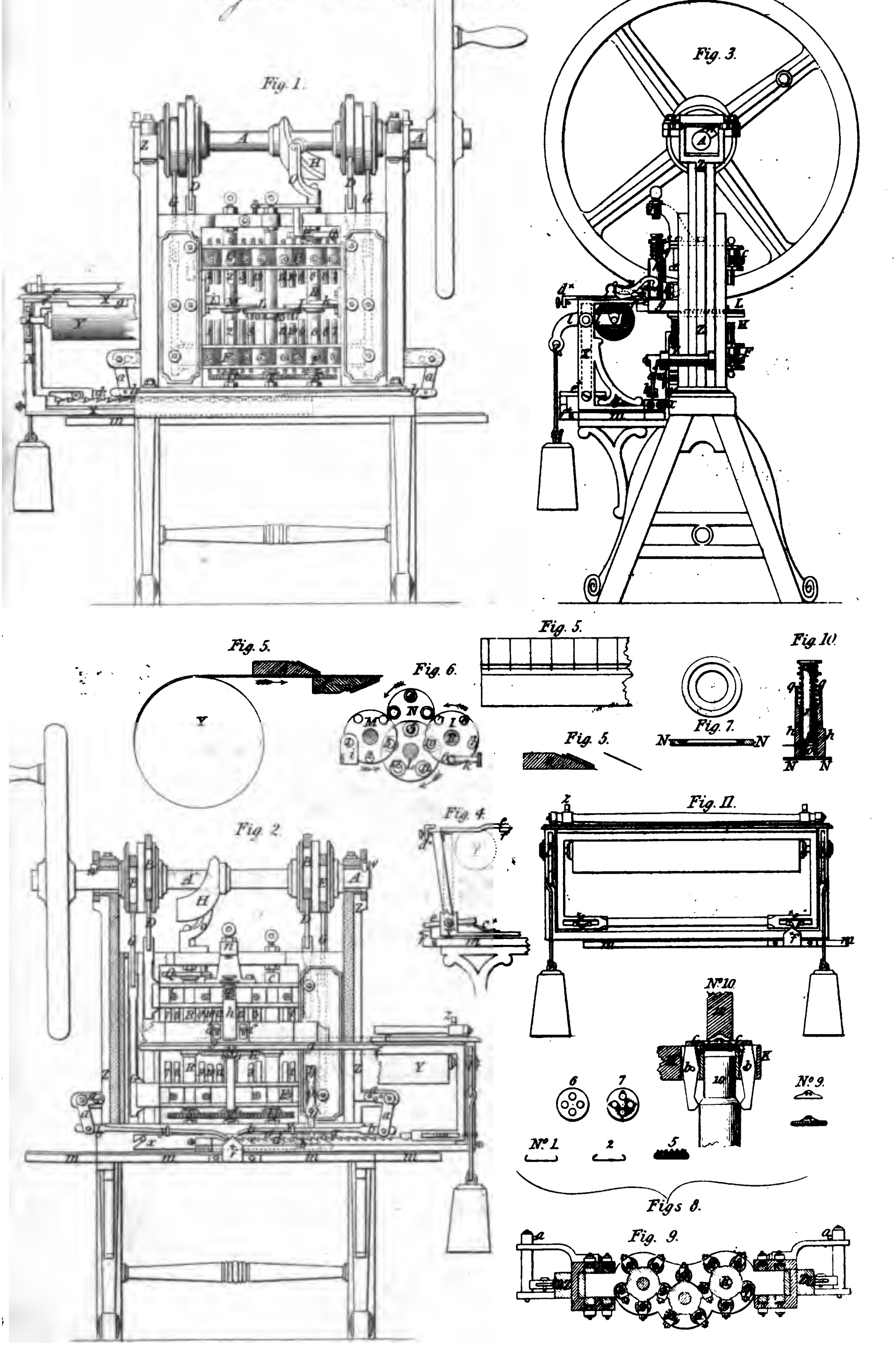


Fig. 1.

1 May 1829.

W. Newton del.

Tyndall's Button Machine.



W. Newton del.

Dickson's Imp.d Gun

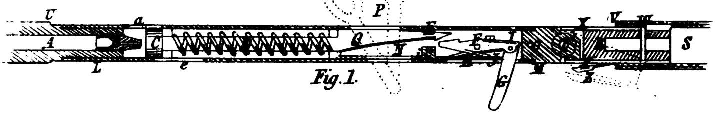


Fig. 1.

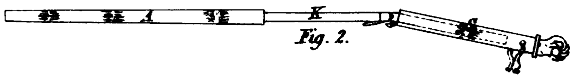


Fig. 2.

Fig. 3.

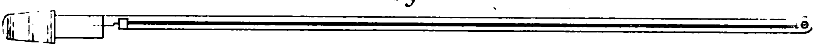


Fig. 4.

Newton's Surgical Bedstead

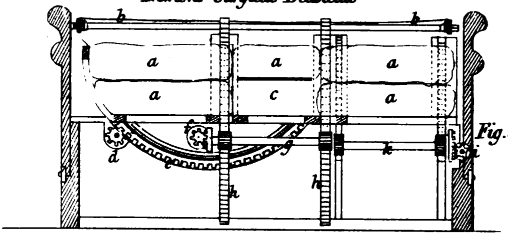


Fig. 8.

Heisch's Spinning Machinery

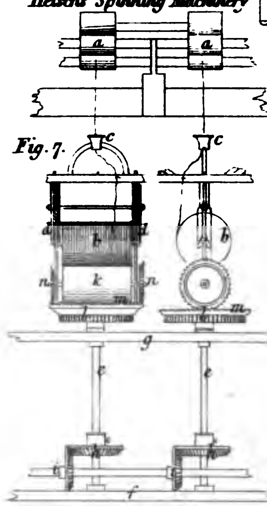
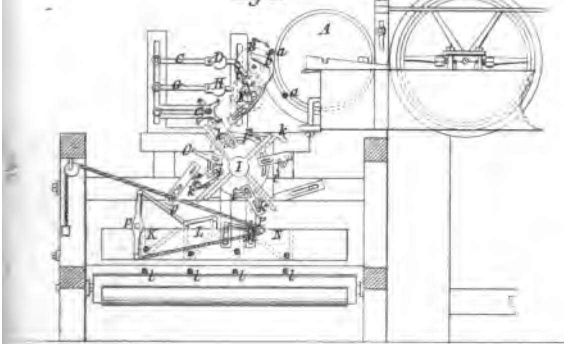


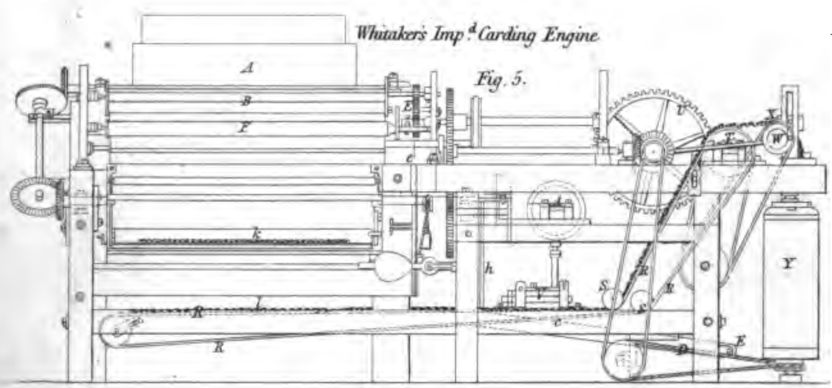
Fig. 7.

Fig. 6.



Whitaker's Imp.d Carding Engine

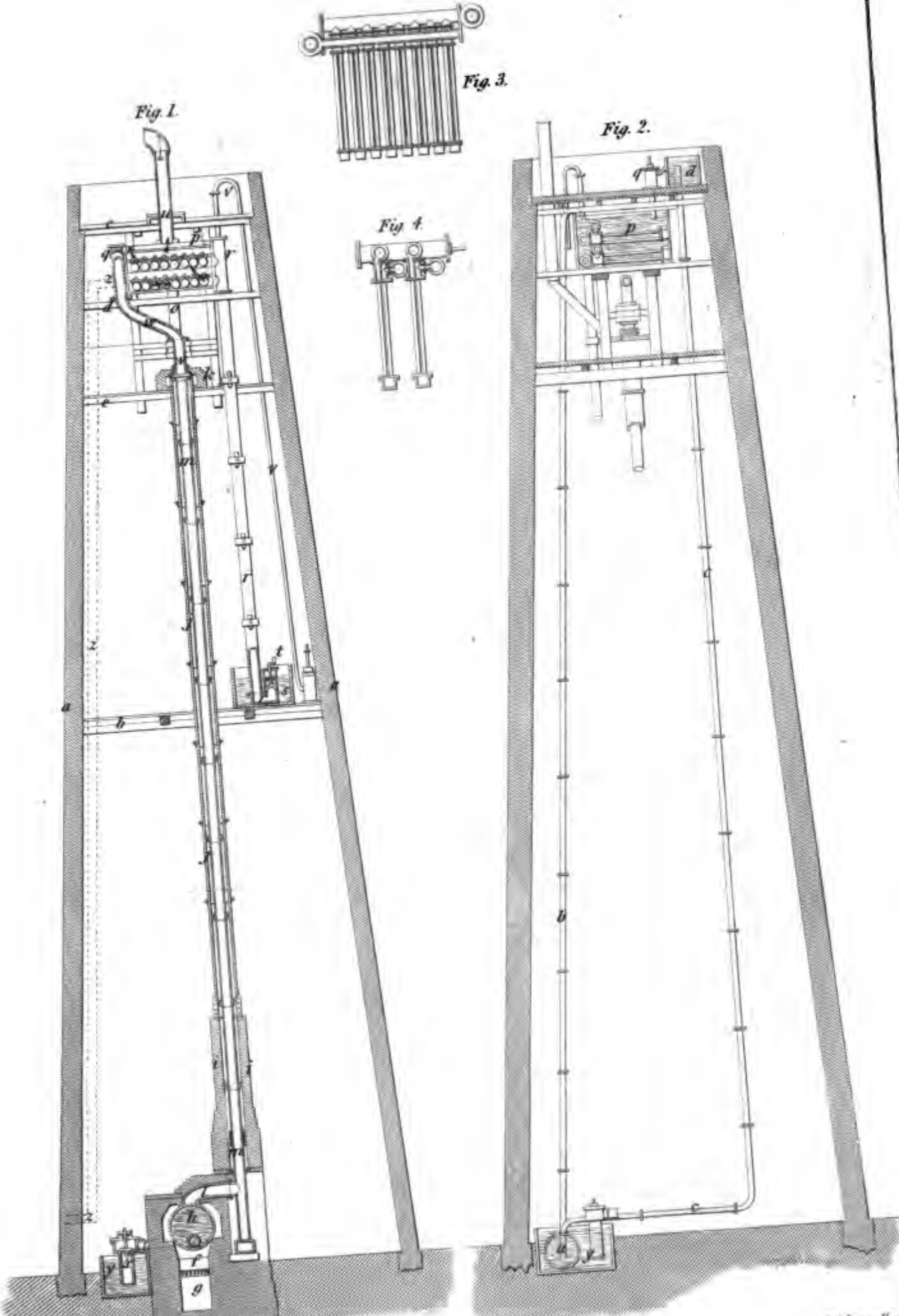
Fig. 5.



W. Newton del.

1 June 1829

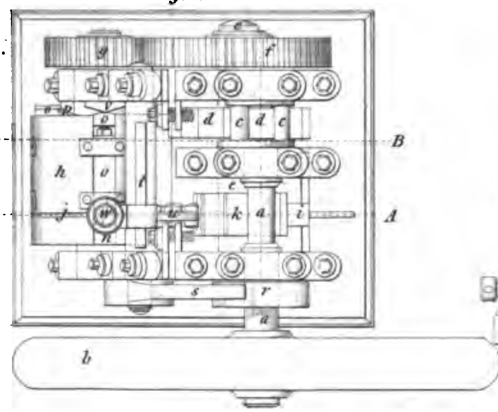
Bernhard's Apparatus for raising Water.



W. Newton del. 1st July 1829. P. Mansell sc.

Tyndall's Machinery for making Nails, Screws, &c.

Fig. 1.



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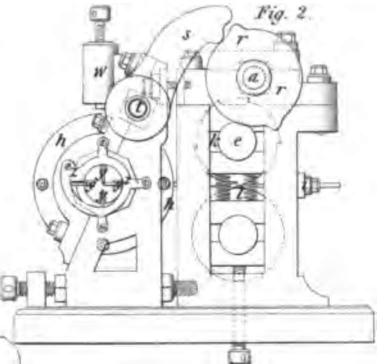

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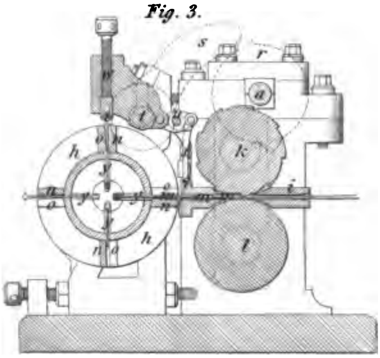

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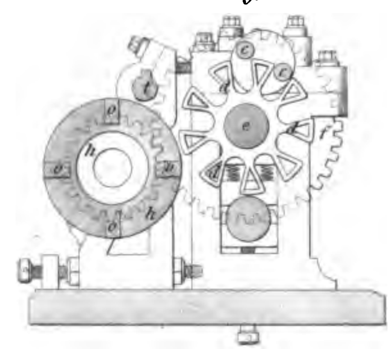


Fig. 5.

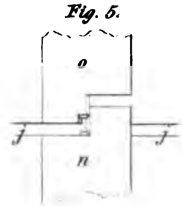


Fig. 6.

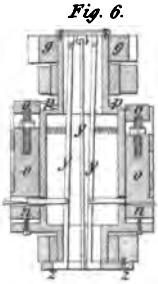


Fig. 10.

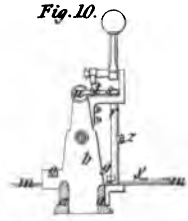


Fig. 12.

Fig. 11.

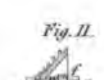


Fig 13.

Fig. 7.

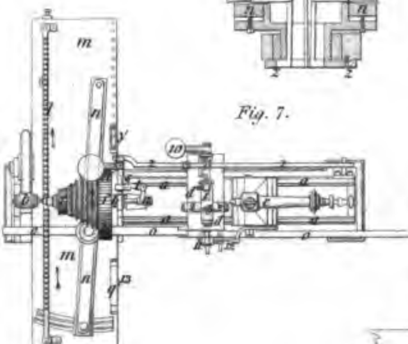
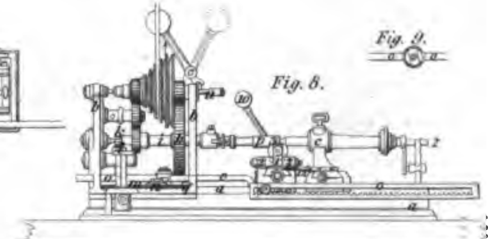
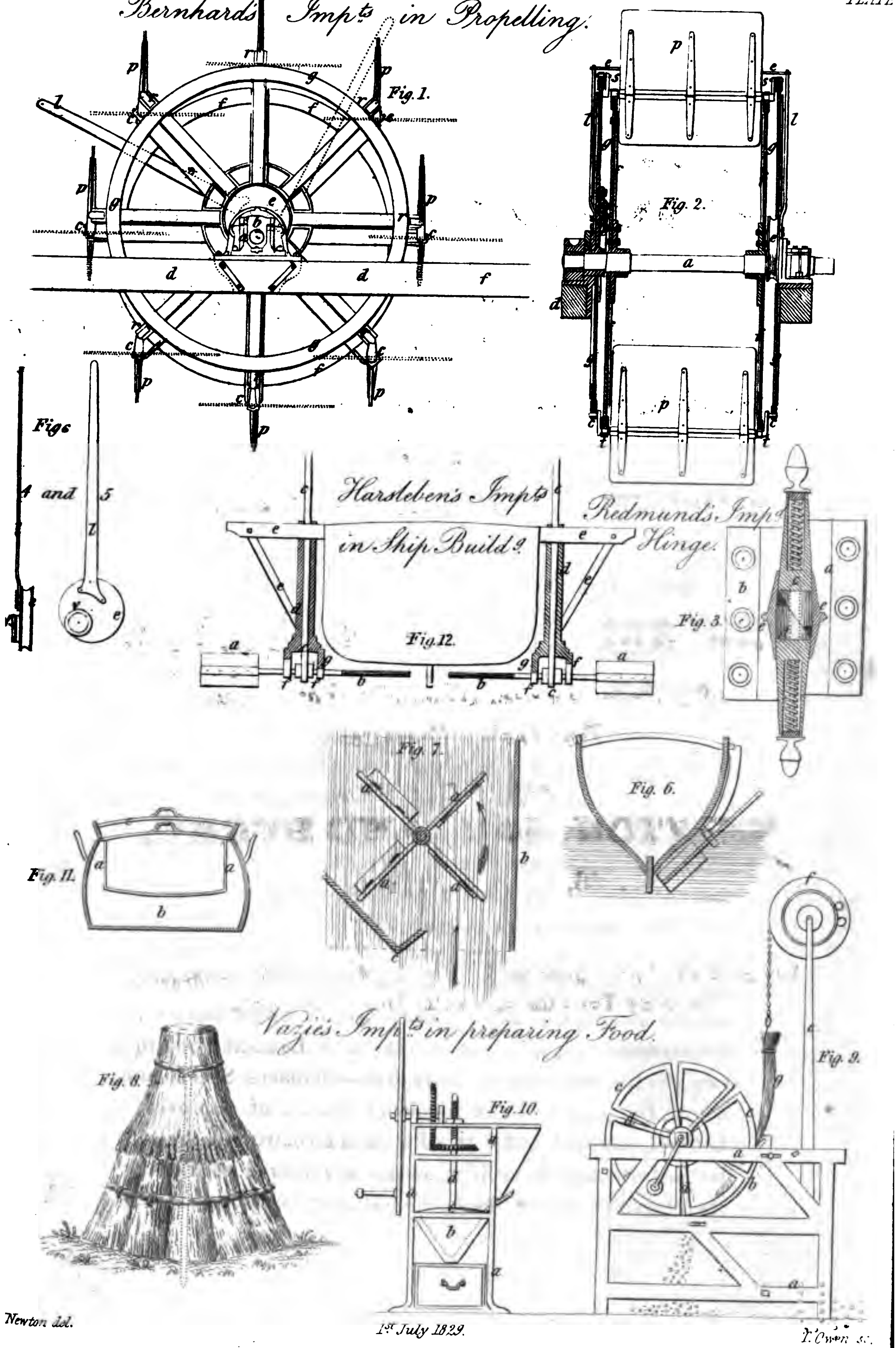


Fig. 9.

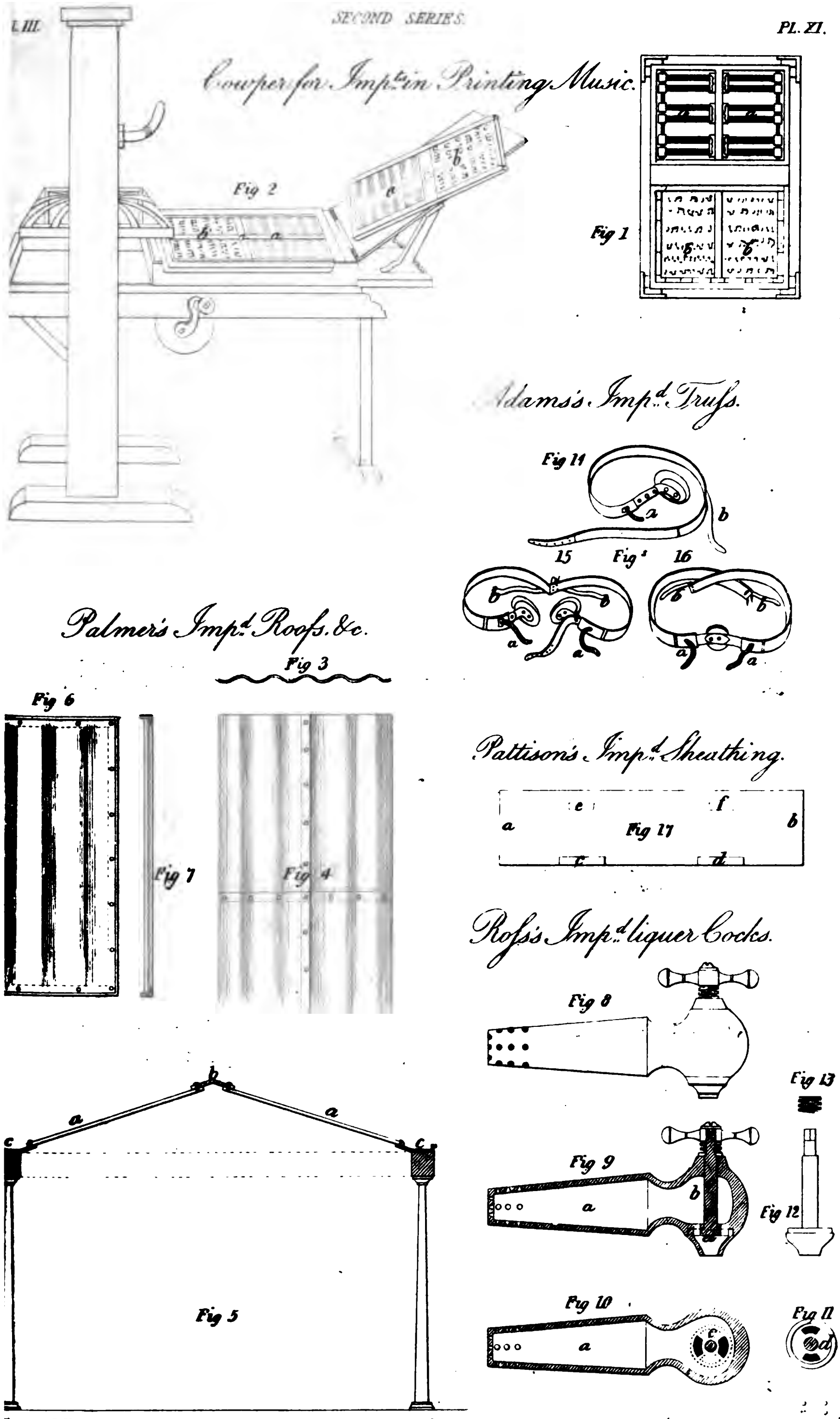
Fig. 8.



W. Newton del. 1st July 1829. T.Phillibrown



Newton del. 1st July 1829. T. Owen sc.



Newton del.t 1st Augt 1829 F Mansell sc

Gough's Steam Carriage.

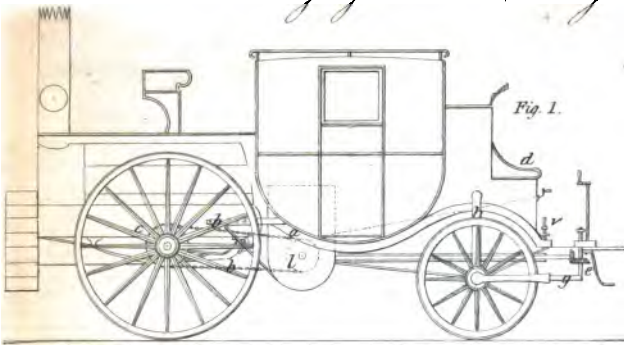
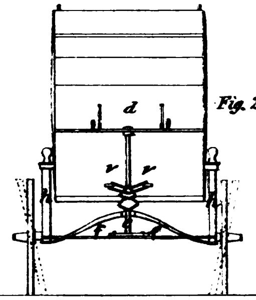


Fig. 1.



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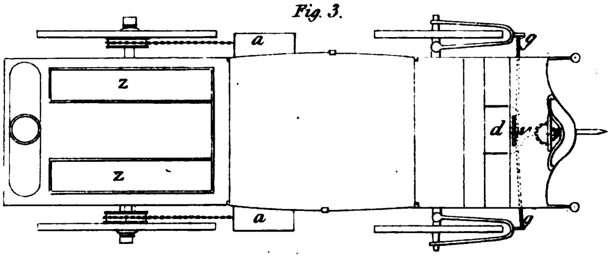

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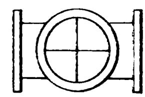

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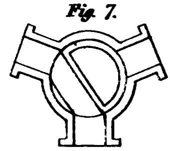

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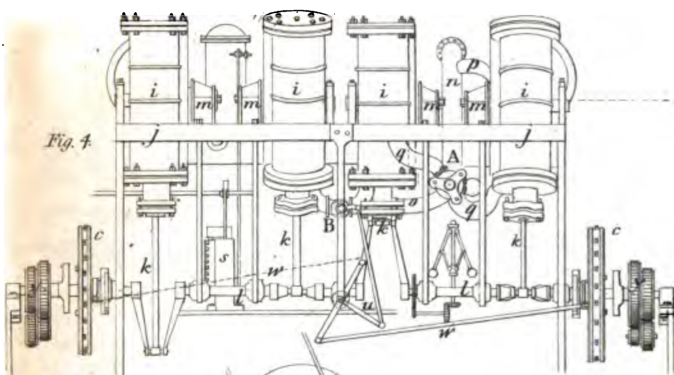


Fig. 4.

Fig. 5.

Marshall's Shearing Machine.

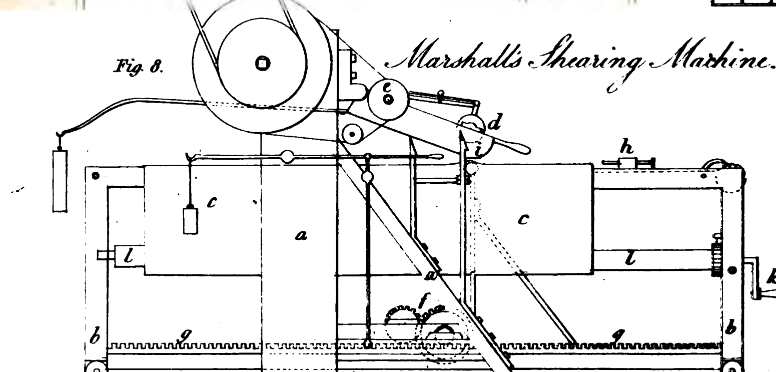
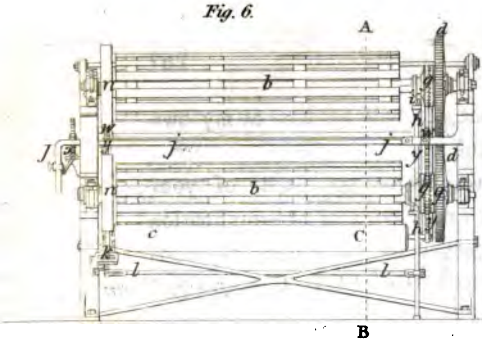


Fig. 8.

Haden's Impd. Machinery for Dressing Cloth.

Fig. 6.



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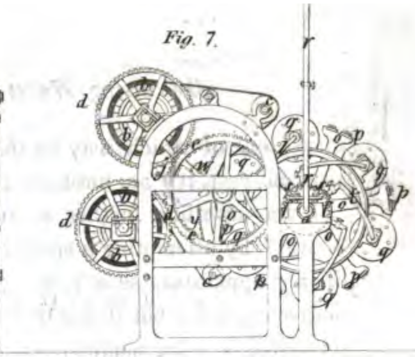

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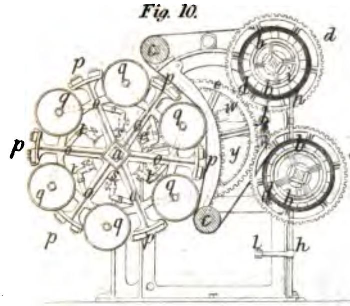

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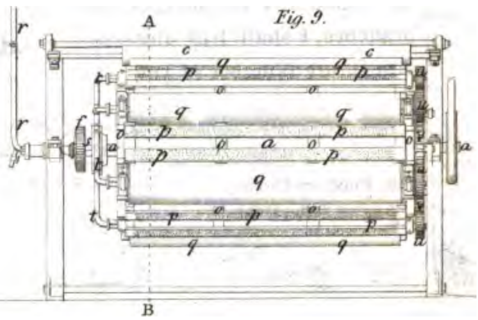
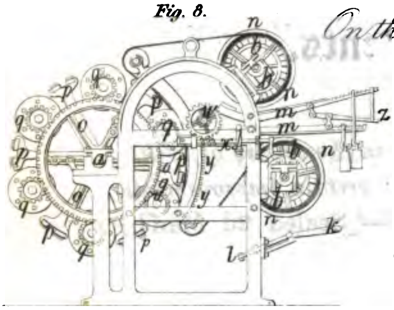


Fig. 8.



On the paralel motion of a Steam Engine.

Fig. 5.

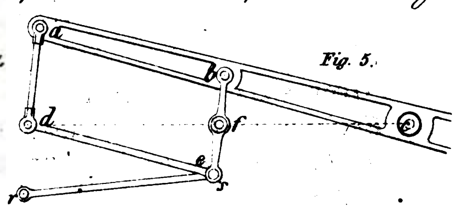
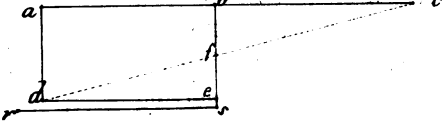


Fig. 3.



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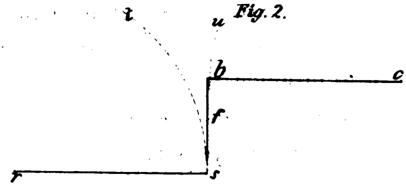


Fig. 4.

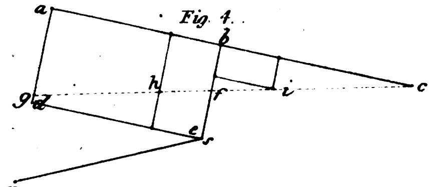
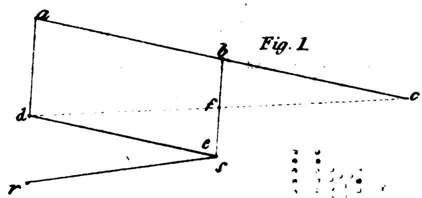


Fig. 1.



W. Newton del. 1st Septr 1829 T. Phillib.

Brunton's Meter

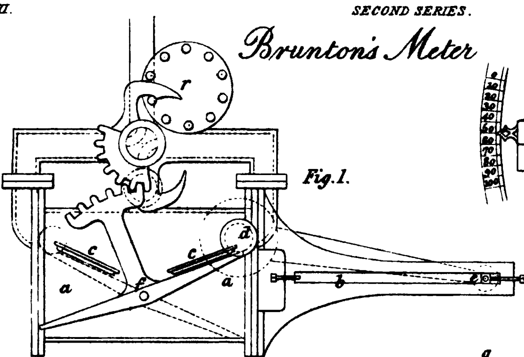
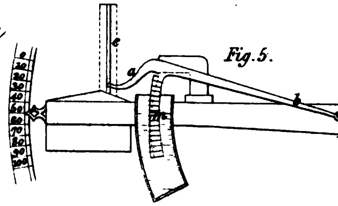


Fig. 1.



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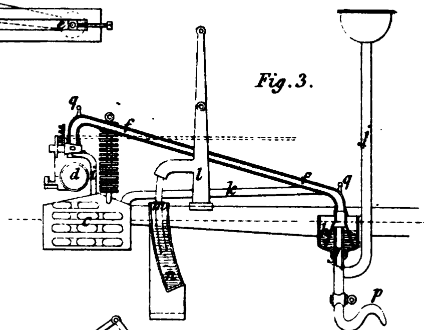

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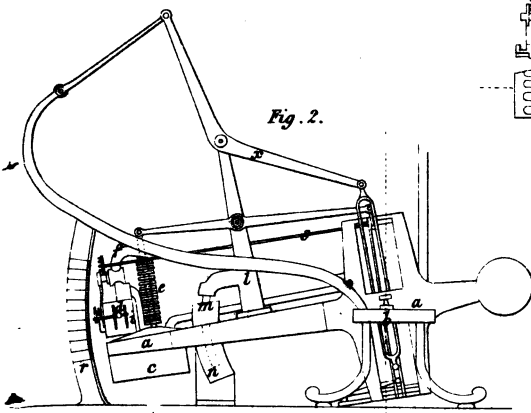

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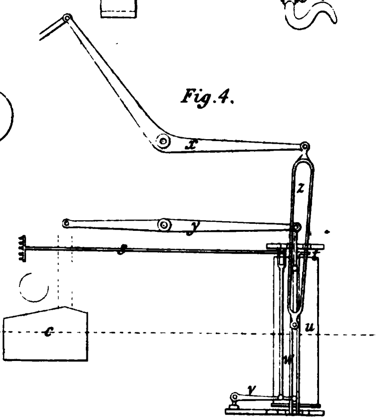
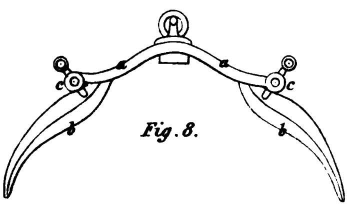


Fig. 4.

Lukins Impd. Horse Collars &c.



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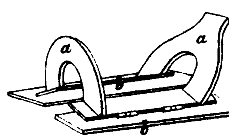
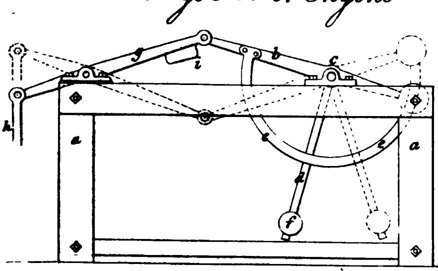


Fig. 9.

Attersleys Power Engine



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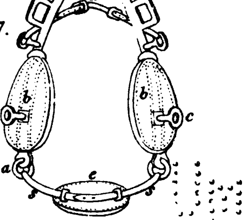

Fig. 7.